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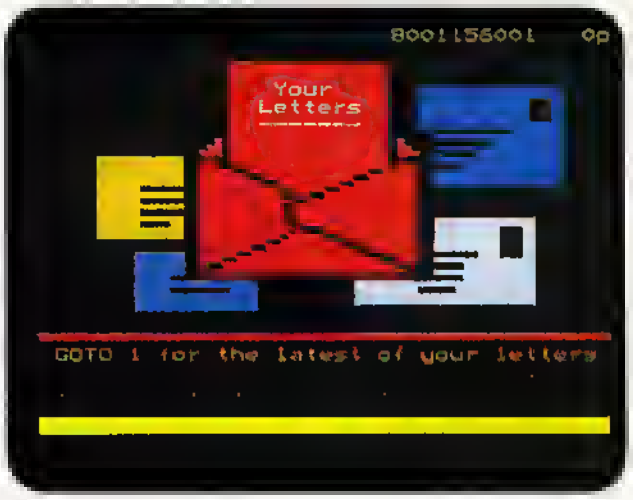

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March, 1985 Vol 3, No 6 ISN 0111-9826

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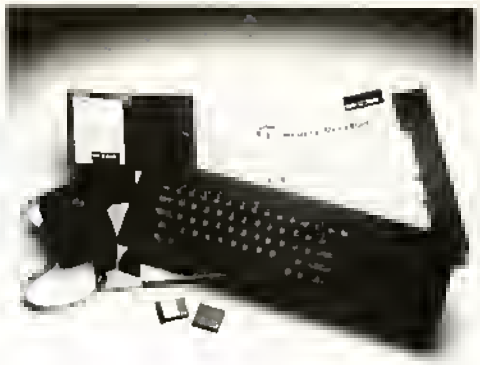

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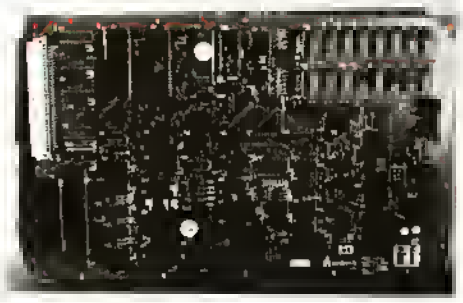

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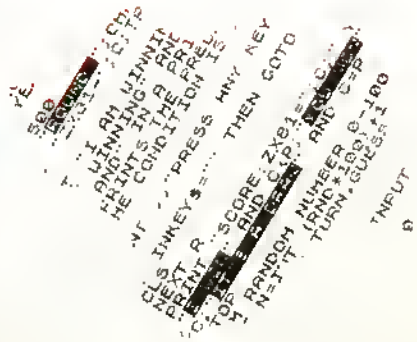

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The Wozniak interview

In 1976, Steve Wozniak, along with collaborator Steve Jobs, hocked a Hewlett-Packard programmable calculator and a Volkswagen van to build the world's first practical microcomputer in a garage, so creating the Apple II legend. And a good deal of the Silicon Valley legend to boot. (Pun intended).

Wozniak, the technical genius behind the development, visited New Zealand last December at the invitation of the Wellington Apple User Club, to attend a champagne breakfast.

Bits & Bytes correspondent John MacGibbon, who also edits the Wellington club's newsletter, lured Wozniak with an offbeat letter inviting him to the breakfast "on behalf of our 100-plus members, the other 2,199,900 New Zealanders, and our 60 million sheep".

Travelling here was to be at Wozniak's own expense, but he was promised free breakfast.

The Wozniak response: "How could I turn down the opportunity to attend a genuine hacker-mode breakfast in a Pizza Hut in New Zealand."

"Woz", spoke for more than two hours among the pizzas, telling tales that included early days in Silicon Valley, the development of Apple Inc, electronic pranks and phone phreaking with Captain Crunch.

John MacGibbon was also able to tape an exclusive interview with Wozniak:

Apple's problem years

MacGibbon: The other day, you were talking about the Apple III taking 90% of the company effort for 3% of the income. Were those the figures?

Wozniak: Three per cent of the income — easily 90% of the creation efforts. Maybe more.

MacGibbon: What years were those?

Wozniak: 1980 to 1983, the years when the Apple II was our largest selling computer. Those days, we had no ads for Apple IIs. If you looked at all the dealer promotions, it was all Apple III. All of our internal product development was Apple III. Our staff all had Apple IIIs on their desks — no Apple IIs. We paid our people to write for computer magazines, and gave them twice as much per word to write about the Apple III.

All we put out for the Apple II was Logo and Pilot, because they were in its small game, home, education, hobby market. We did not develop those. We basically just bought them and got them into shape for shipping, with minimal development.

To the outside world's mind, you could use the Apple II for almost anything. Everyone kept trying to use the Apple II for business purposes and add more to it: plug-in cards, more memory, every spreadsheet you could buy. You could also buy cards to plug in — have a megabyte of memory. They got hard disks onto it somehow, and they got operating systems, and they added all the things they wanted.

We should have looked at the users: what they wanted, where they were trying to take the machine was the indication of where we should have supported it. And we didn't.

We had the Apple III positioned as our business machine, and never paid attention to the fact it was always going to be such a small percentage of our sales. We should have diverted our resources to supporting the Apple II. Even the Apple IIe development came about only as an undercover operation by a manager and an engineer within the Apple II division.

MacGibbon: Even if Apple had got behind the II at that stage, and if the III hadn't had such a disastrous start, do you think the IBM PC's drive would have been significantly blunted?

Wozniak: I actually believe that if the III had been done right, then it would have been the choice of the higher capability community — instead of the PC. I also think if in the early days we had admitted the Apple III hadn't taken off right, and instead focused on the Apple II as a higher end business and office solution, we could have given it (the Apple II) a larger share of the market. We could have put in a lot of the things the market considered important.

MacGibbon: Once you ironed out the Apple III's technical problems, it turned out a pretty good machine, didn't it?

Wozniak: It's an excellent machine except for openness. We didn't say enough about it — how it works, documentation, use this when you want to, go try this. You know, let users find their own solutions. We sort of said no. We said we're so brilliant, we created such a perfect solution. Engineering said "we don't want anybody tampering with this and doing all the random things that are almost impossible to support".

MacGibbon: How important has been the appointment of John Scully (ex Pepsi Cola) as president, in the turnaround in Apple's fortunes?

Wozniak: The new president wasn't tied to a lot of the sacred cow projects. He came in, looked things over very quickly and realised the Apple III was a small percentage of our income, and all of our expenses. He refocused a lot of energy on the Apple II and it's starting to take place.

The most inspirational person in the world is Steve Jobs. He is very brilliant, spotted a lot of the answers and has created an incredible new technology product — the Macintosh — rather than just follow in the IBM footsteps. John Scully is heavily behind that and giving support above it.

The company image from this point on will be associated with Macintosh. It gives us higher credibility, although it's still a smaller percentage of our unit sales.

MacGibbon: Apple's stocks are still pretty volatile, aren't they?

Wozniak: They go up and down wildly because we've been a company with only one product the (Apple II) that ever made money. The value of Apple stock has varied nearly six to one in a six-month time frame. There were periods a little over a year ago when the American community, the press, were pretty much predicting Apple's demise, and the stock went from 30 to 20 in one day. But a year and a half ago, it was down to 11. A little less than a year ago, it was up to $63.

It varies so greatly because it's been a very unpredictable future for a company with only one product that's selling. Now we're in a little healthier shape in that we have two products selling.

The company's future is still at risk. The whole personal computer business is. It's a very difficult business when you're trying to tailor products to the mass consumer market.

Eventually it will become less a creation battle, and just an efficient manufacturing battle. And the Japanese have a lead there.

MacGibbon: Already?

Wozniak: Whenever it comes down to efficient manufacturing, America's tended to fall into second place.

Macintosh

MacGibbon: Didn't the manufacturing techniques in the Macintosh plant borrow from the Japanese?

Wozniak: They attempted to. There was a lot of hype. For example, the major automation features of the Macintosh factory actually didn't work. So we took'em out and put in people rolling carts around. The challenges are very difficult when you're doing it for the first time. We're almost breaking new ground with that factory.

MacGibbon: Is the Macintosh Apple's saviour?

Wozniak: Steve Jobs makes a lot of enemies everywhere in the company, so almost everyone in the Apple II division, every manager right up to the division management, thought Macintosh was

taking away a lot of what they had to work with. It was getting all the attention and dollars and focus. Pretty much the opinion at the executive level was that Macintosh was still a risky project.

The people who were actually working on Macintosh, knew what a great computer it was. They knew it was the one they'd want in their own lives, as computer people. They felt Steve Jobs was saving the company, and pretty much that's what it seemed like to me too. The product was accepted as a winner and took off when it came out. It was accepted as a good computer. Almost nobody has bad things to say about it, other than maybe it's not quite the computer for them.

MacGibbon: People have wondered if the mouse is such a wonderful thing . . .
Wozniak: If I were in control of these decisions, and I'm obviously not, I would have said, sure a mouse is great for a lot of things. But boy, if you allow options, everyone uses them and swears by them. So everyone I've ever heard I totally agree with — we should have had arrow keys as well as the mouse.

I personally find — even with word processors — that if there is a mouse available, I just will not want to use the arrows, even when they're available, as they are on my IIc. But you should still leave in a lot of options and simplifications. We should always allow a good flexible range of shortcuts.

MacGibbon: I certainly prefer to keep my hands on the keyboard when word processing — I don't like having to use the mouse to move the cursor around.
Wozniak: Almost everywhere I go, people say that. It might just be because the mouse stands out as a big difference factor. People who use the mouse all the time wind up swearing by it. But people who've done the most computer science or word processing, using all the fanciest editors that have ever been done, for instance under the UNIX environment, pretty much hate the mouse. They'd rather build in a lot of other more flexible ways of doing things.

MacGibbon: What else do people ask you about the Macintosh?
Wozniak: The biggest questions are whether there's a colour Mac on the way, or why there aren't any slots. It turns out that just because you can define the perfect machine, with everything built in, it doesn't hurt to leave a couple of slots, or an expansion bus coming out the side, like IBM did with their PCjr. It doesn't hurt. Boy — it buys you the future.

MacGibbon: Is there a colour Mac coming?
Wozniak: If there were, I couldn't talk about it.

MacGibbon: How much memory do you think the Mac will eventually have?
Wozniak: I think the Macintosh will be around as a major competitor for probably 10 years. In 10 years, I expect that with the cost of memory falling so drastically, you'll automatically have enough memory in a personal computer to have dictionaries on-line, your major applications on-line. I think it will end up being four megabytes at the end of that time frame. Fortunately everything that's been written on Macintosh can work on four magabytes, just because of the operating system handling it.

MacGibbon: With a four megabyte Macintosh, what's the point of a Lisa?
Wozniak: There are levels of software sophistication Macintosh still has attain, to do some things as well or as unified as Lisa does. It's possible Lisa could be replaced, because Macintosh could wind up being a better computer for less than half the price. When that's the case, it will be just Macintosh.

MacGibbon: What's beyond the Macintosh?
Wozniak: Pretty much we don't think in terms of every year we've got to come up with some new computer to hook the world on as a standard. We've got two good sellers now — the Apple II and the Macintosh. A lot of the improvements are really going to be in software. For example, a better AppleWorks could be a major improvement in everyone's life. You don't necessarily have to invent a new computer based on a new processor to achieve improvements.

Apple II

MacGibbon: How is the new Apple IIc going?
Wonziak: It's still a little new. I figure you've got to give it some time before it reaches its final level. Initial sales were really not what we expected at all. We converted our main factory over to produce IIcs that we thought everyone would buy, and because our users didn't switch their purchase tendencies immediately, we wound up with 100,000 back orders on IIes and 100,000 IIcs in a warehouse. It cost us heavily, because they were basically sales that we won't make up.

The IIc has bounced back though. What happened was that the dealers couldn't get IIes, so they had to find a way to make money. They found out how to sell the IIc.

Like — both computers are Apple IIs. They both run the same software, they both are very compatible. I wish they were more so, because it really stands out. We should always treat our Apple IIs as members of the same family and very compatible. We should not pretend the IIc is such a totally different computer. Basically, we created the whole world over instead of working it into the family.

MacGibbon: What is the chief advantage of the IIc?
Wozniak: I claim its advantage is that it's pre-built — not that it's small and lightweight. People are not going to carry their computer back and forth, day after day for years. No, No, No, you get to a point that very few people are ever going to need the portability.

It's just that it's pre-assembled. The printer port's built-in, the modem port's

built in, the floppy disk is built in, the mouse is built in. You don't have to plug in the cards, read the manuals, figure out how to do it, open the boxes, connect the cables, set the dip switches. But it turns out that's not incompatible with having slots, for the easiest and simplest peripherals.

We had one program at one time that doesn't exist any more, called the IIx, and it had both: built-in and slots.

MacGibbon: Is there any possibility at all of adding CP/M to the IIc as a peripheral?

Wozniak: No. Not feasible. But the thing is, if you're going to have a computer that winds up just sitting in one place and not being used for carryability, buy a IIe. I mean, with the IIe, you're basically safe for anything that ever comes out in the future. Enhancements, any plug-in cards with more memory, higher speed, better processors: any of that stuff will work on a IIe, and you're safe. It's too bad we didn't build a little more in for you to save the first two hours of hassle.

MacGibbon: Do you regret not putting the 3.5in Sony drive in the IIc?

Wozniak: No, because it wasn't around in sufficient quantity at the time the decision was made.

MacGibbon, If you did it now, would you put in the Sony drive?

Wozniak: No question. The current philosophies of the company, largely driven by Steve Jobs, are tending towards a more simple, unified approach where, for instance, one printer works across all our family of computers. One plotter for all of them. One interconnect scheme for monitors, one modem for all. We would certainly prefer to have only one type of disk drive. We wouldn't have to stock so many parts around Apple.

MacGibbon: But then you'd have incompatibility with your older II series.

Wozniak: Yes, but only for a crossover durtion. You sometimes have to improve your technology capability and have the two of them side by side for a while. It can cause problems, but it can be thought out and dealt with during that time.

MacGibbon: Will you move to a 3.5in drive for the 11c?

Wozniak: That's our intention.

MacGibbon: Would you do a retrofit for existing IIcs?

Wozniak: There are a lot of outs. Obviously if you built a 3.5in drive in, you'd want to plug a 5.25in drive in too. And vice-versa. If you plug a disk drive into the IIc's external slot, that could theoretically be a 3.5in, if we designed it to do that. We've used the same controller chip that Macintosh uses, controlling the disk. So we could easily run a 3.5in, with its additional capabilities and dual density.

But it's interesting, and I'm not sure if it's in the manuals, that if you type "PR#7", the IIc boots from the plugged-in drive, not from the built-in. That was a very clever thing, and I don't know why we never told anyone. It was originally put in very thoughtfully by some of the firmware people, on the grounds of not knowing yet where we were going.

MacGibbon: Do you see a large market for peripherals that plug into the serial ports?

Wozniak: They'll be slower in coming than peripherals were in the old days. You've got to do the plastics and the cabling and you've got to receive signals out of serial ports and convert them to whatever format you need. It's not as easy as plugging onto a processor bus with card. Those were the simplest, quickest ones to design in the early days.

But fortunately it's a new computer. It's perceived as a newer market by developers, and let's jump in and do something we know how to do and get it onto this machine. It's one of the machines that's been accepted, and that will help. Development time will be a little longer because it's got to be a larger investment.

• To be continued

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Subscriptions, Production and Book Club
First floor, Oxford Court, 222 Oxford Terrace, P.O. Box 827, Christchurch. Telephone 66-566.

Managing Editor — Paul Crooks
Editor — Gale Ellis
Production Manager — Dion Crooks

Advertising Representatives
Auckland — Paul O'Donoghue, P.O. Box 9870, Telephone 549-028.
Wellington — Marc Heymann, P.O. Box 27-205, Telephone 844-985.
Christchurch — Jocelyn Howard, P.O. Box 827, Telephone 66-566.

Editorial Representatives
Wellington — Pat Churchill, 5 Lucknow Terrace, Khandallah, Telephone 797-193.
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Are you up with the play?

Bits & Bytes is increasing its focus on serious business and educational applications: we are looking for reviewers to help keep our growing business readership up with the play.

If you are interested in joining our team of reviewers, or columnists and taking an in-depth look at new software and hardware as it becomes available on the New Zealand market.

Contact:
Gaie Ellis,
P.O. Box 9870,
Newmarket. Phone 549-028, 549 677

The small business & computing

We are starting a new column on computing and the small business. If you are interested in contributing to such a column please contact:
Gaie Ellis,
P.O. Box 9870,
Newmarket. Phone 549-028, 549 677

Eureka!

A new adventure game released here for the Commodore 64 has a $25,000 pot of gold at the end of it.

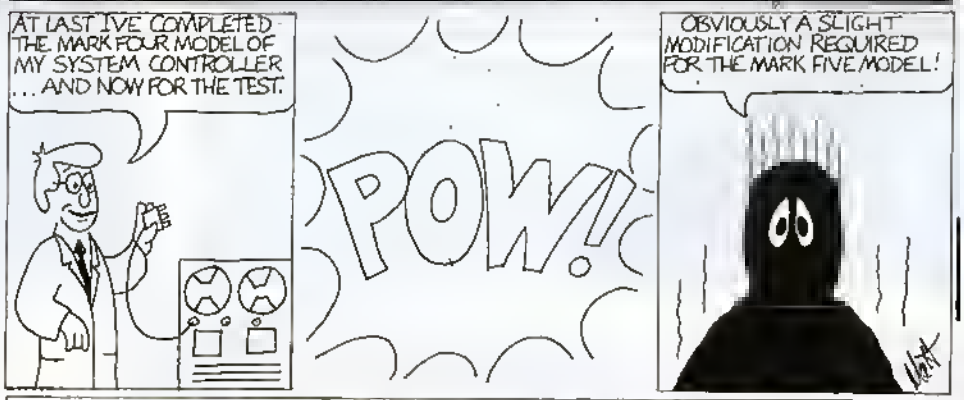
Eureka is, in fact, a suite of five full colour graphic adventure programs, all non-violent and each set in a different time period — prehistoric Europe, Roman Italy, Arthurian Britain, wartime Germany and modern Caribbean.

To win the £25,000 (about $60,000 New Zealand), the player must progress through all the adventures collecting clues. At the end you have a phone number to call (unfortunately in Britain). On doing so, you are asked a question, and the first to get it correct wins the cash.

The package has just been released worldwide but the originators don't expect anyone to crack it for months. If no one has claimed the prize by December 31, the prize will be distributed equally between all registered owners.

The software consists of more than 250K of mystery and is delivered on two sides of a disk costing $79.95. The New Zealand distributor is Commodore Computers (P.O. Box 33-847, Takapuna).

MICRO MOMENTS — BY MATT KILLIP



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Integral PC on its way

By Pat Churchill

The first shipment of Hewlett-Packard's Integral Personal Computer, a 16/32-bit UNIX-based system in a transportable package is expected about the middle of this month.

Hewlett-Packard says the Integral is the first personal computer designed to provide the performance benefits of a ROM-based UNIX operating system (HP-UX) in a package combining full integration, power and ease of use with a low base price.

The Integral PC is believed to cost over a third less than other Winchester disk-based UNIX systems and is comparable in price with MS-DOS personal computers which lack the capabilities of the UNIX system, such as multi-tasking.

The 25lb transportable package has a built-in Thinkjet printer, a 3in double sided disk drive, a 9in electroluminescent display and a full-size keyboard. The computer is based on the Motorola 68000 16/32 bit HP graphics processor.

Standard memory is 800K (expandable) and the HP-IB expansion interface (IEEE 488) is also standard. There are five interface options.

Languages available (at present) for software development are HP-UX technical BASIC and HP-UX C. Software packages include PC aided design, maths/stats, database management, communications, spreadsheet and word processing.

The local price is expected to be around $12,000 which includes the HP-UX system, HP Windows and Personal Applications Manager.

There are ports on the front for devices such as keyboard, mouse, bar-code reader or graphics tablet. There is an optional 300/1200 baud modem for data communications.

Lisa now Macintosh

Apple has re-named and re-priced the Lisa 2/10: it will now be known as the Macintosh XL and the new price tag is $18,950, compared with the earlier price or $23,400.

Dealers were told at the annual conference in Rotorua last month that the move reflects the computer's role in Apple's more recent line of business products.

The newly appointed marketing manager, Mal Thompson, says

The Integral Personal Computer.

people who own the Lisa 7/7 business software will be offered a migration path into networking with the Macintosh office product range.

Peripheral range

Southmark Electronics Ltd has been appointed the New Zealand dealer for the US-manufactured Tecmar range of computer peripherals.

The range concentrates on memory, storage and laboratory peripherals for the IBM PC range and more recently, includes storage units for the Apple Macintosh.

Atari software

Stargate Enterprises (P.O. Box 2240, Tauranga South) is offering dealers a full range of software for the Atari computer systems. Software is available from Synapse, First Star, Infocom and Strategic Simulations Incorporated (S.S.I.). Educational software comes from C8S (Sesame Street titles), and PDI (Program Development Inc.) and has packages for all levels.

Volume leader

Sinclair Research, the British-based computer manufacturer, has announced it has sold its five millionth computer, making it the world's top volume microcomputer company.

Founded in July 1979 by Sir Clive Sinclair, Sinclair Research Ltd has designed and developed the ZX80, ZX81, ZX Spectrum, QL and Spectrum +.

Sinclair now sells to more than 70 countries, including the Eastern Bloc and China.

UNIX repeat

The UNIX environment will be the theme for the second UNIX workshop and exhibition at Massey University, Palmerston North on May 26–28. The first UNIX gathering was held at Waikato University last May, and was regarded as a huge success by most attendees. As a consequence, the organisers anticipate that there will be keen demand for the 150 places available at the next workshop.

Several overseas speakers have indicated they will attend, and the organisers are hoping local people with some UNIX experience will present papers on topics such as: suitability of the UNIX programming environment for writing commercial software; software support for UNIX systems in New Zealand; standardisation on UNIX — a good thing or are there better alternatives?; UNIX and communications.

C64 double

The Commodore 64 has been voted Home Computer of the Year for the second year running. Judging was done by seven international computing magazines (none, incidentally, dedicated to Commodore users) from Britain, Germany, Italy, France, the Netherlands and USA.

Accountants need to insure

There is a need for accountants to insure against data loss or corruption, warns Hartley Computers (NZ) Ltd.

The New Zealand general manager, Dean Wotherspoon, says that insurance against information loss is not as expensive as many professionals believe and every avenue to prevent loss and disruption to business is important.

"We are used to insuring our hardware and tangible material assets against accident or damage but many people do not realise the importance of insuring against data corruption."

Costs could be as low as $50, a small price when the cost of recreating damaged information was taken into account, he said.

Hartley Computers is part of the Paxus Information group which is the New Zealand Insurance's information services group of companies.

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P1617

Very British Apricots

Red carpet, a butler at the door and a representative of H.M. government — it was all very British.

Appropriate, too, as the range of computers launched by Barson Computers in Auckland last month is made by a company helping to spearhead the renaissance in British tecnology.

The new Apricot machines (a PC model has been sold here for some months) are made in Scotland's "Silicon Glen" by Birmingham-based Applied Computer Techniques, a 20-year-old company which has successfully moved from a base in software to hardware distribution, hardware manufacture and now international operations.

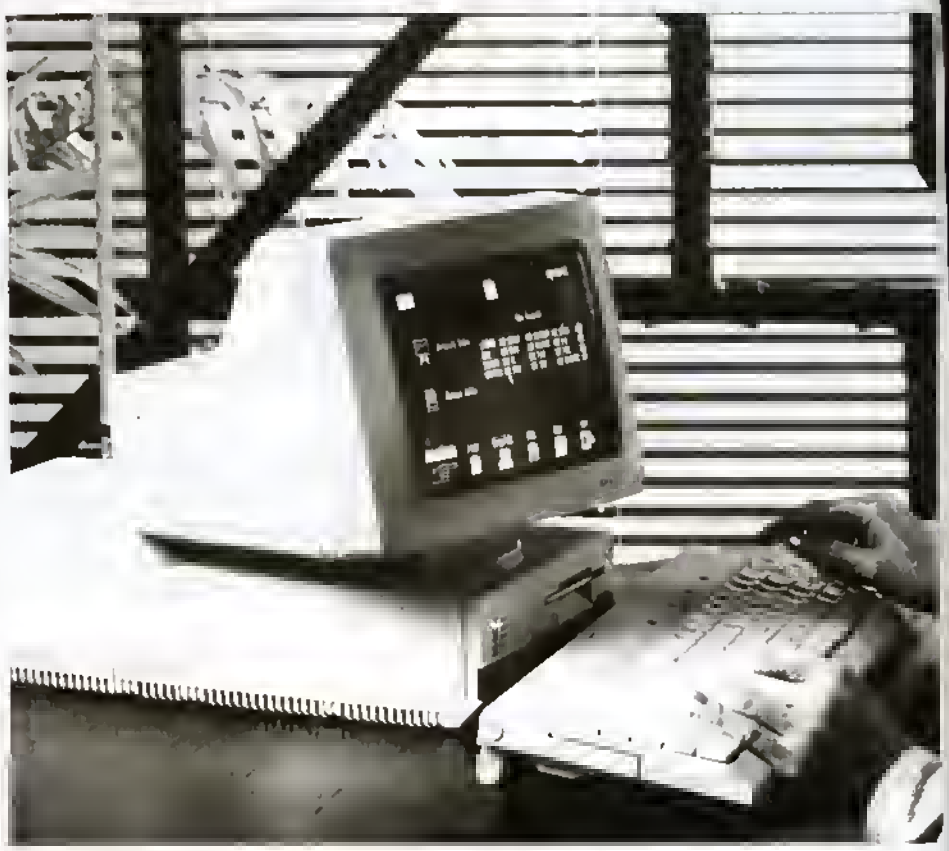
There to lend an official air to the proceedings was Sir Anthony Rawlinson, permanent secretary at the British Department of Trade and Industry. He spoke of the surge in UK technological development that has been spurred by such events as the Information Technology year in 19B2, and described ACT's technology as a prime example of the innovation that is putting British technical work back on the map.

A video, especially made for the New Zealand function by ACT's managing director, Roger Foster, introduced the new Apricots, which run from a voice-operated portable to the 16-bit F1, through two PC models to the Point 7 and Point 32 systems. These are file servers with associated cluster controllers capable of supporting another six and 31 users respectively.

Barson New Zealand's managing director, Doug Pauling, made it clear he hopes to emulate the success of Barson Australia in the education market. Barson has won a New South Wales contract for a huge Apricot-based educational micro-computer network.

"Backed by the biggest library of alternative software in the world and with true state-of-the-art hardware, we are confident we cannot only expand in the education field but also attract strong business and government department interest," he claimed.

Pauling sees the Point 7 and Point 32 systems as particularly important for his dealers. The machines will allow them to open up significant new markets in medium-sized businesses.



The entry-level Apricot F1 business computer

New Atari range

Atari has announced a new range of low cost eight-bit and 16/32 bit computers in the USA.

The announcement signals former Commodore boss and now owner of Atari Corporation Jack Tramiel's intention to tackle Commodore and Apple head-on in a more bytes for your buck war.

With the shock announcement that Coleco is ceasing production immediately of its home computer, the Adam, it seems that only Tramiel and Atari can now stop Commodore from almost totally dominating the home computer market, at least in the USA.

But while the new range of Atari computers was on display at the huge consumer electronics show in Las Vegas in January, Atari staff weren't allowing people to actually play with them and it seems production models may be some months away. The New Zealand agent for Atari, Monaco Distributors, says it isn't expecting the new models to reach our shores before the middle of next year.

The new XE family of eight-bit computers is 100% compatible with the existing Atari 600 and 800 XL range but offers a variety of additional features. These seem to involve mainly more RAM, graphics and musical capabilities. However there is also a portable model with a built in 5in screen (about the size of the old Osborne screens) displaying 40 columns by 20 rows and a built-in 3.5in disk drive. The cheapest model in the range will sell in the USA for under $120.

Probably of more interest will be the 130 and 520 ST computers which use the 16/32 bit MC68000 processor and incorporate a Macintosh-like operating environment called GEM.

Designed by Digital Research and Atari, GEM includes such features as overlapping windows, drop down menus and icons along with support for pointing devices such as a mouse.

The 130 ST, with 12BK of RAM, will retail for $399 in the USA like the 520 ST, with 512K of RAM, will retail for $US599. This compares with a US price of round $2500 for the Macintosh.

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NZ137

Changes in Asia

By Pat Churchill

..There has been a dramatic change in products offered at electronics shows in Asia, says Check Point Computers' managing director, Tony Pointon.

"The previous year, the emphasis was on eight-bit and 6502 processor machines. This had changed mainly to 16 bit computers and the 8088 processor — same as the IBM PC processor," said Pointon who, with his partner, John Davis, visited shows in Asia late last year.

There was very little in the way of computers with 6502 or Z80A processors, a swing he called "dramatic".

Each year, a peripheral gained acceptance in the market.

"When we started our business two and a half years ago, in the field of educational and home use people were wondering about TV's versus monitors, and had mostly tape drives. Peripherals to gain acceptance were monitors then disk drives. Next came printers. Eighteen months ago, very few home computer users had printers."

Pointon predicts the peripheral for 1985 will be the hard disk.

"The price is dropping. We are able to offer an Apple compatible hard disk drives for under $3500. The price is slightly higher for hard disks for IBM and IBM-compatible machines."

Based on what he saw in Singapore, Hong Kong and Taipei, Pointon believes these drives, with a 10mb capacity, will be this year's peripheral success story, particularly for the small end of the business market.

While the shows didn't reflect the leading edge of technology, they did point up which area of the market was the most popular at the time. This year, it was the 16-bit IBM and IBM-compatible market.

But there was a development in the wings likely to make an impact on the New Zealand market this year.

"This is the Japanese MSX machines. The Japanese have developed this standard in hardware and also in software. Approximately 12 Japanese companies are now manufacturing to meet that standard, plus two in Hong Kong and some in Singapore.

"At present, they are avoiding the US market until they get to the stage of a mature marketing and support point of view. However, they are now marketing strongly in Europe, will be moving to Australia soon, and then to New Zealand — probably around the end of the first quarter of this year."

Pointon said the reason for the delay in going to the USA was that the US market "is such a mess and a hassle" and the Japanese wanted to go in with strength.

"This is just about the first example of a standard being set and accepted by a number of companies, and being adhered to. All the names are there — Sanyo, Pansonic, Mitsubishi."

Pointon said the cheap copy business was being "quite strongly" discouraged by the Taiwanese government. It also discouraged complete copies of other people's computers.

"In Hong Kong, there was quite a bit of cheap software, mostly for Apple and some for IBM PCs. One centre in Hong Kong had a lot of pirated software."

Cheap software and copies of manuals were also available in Singapore.

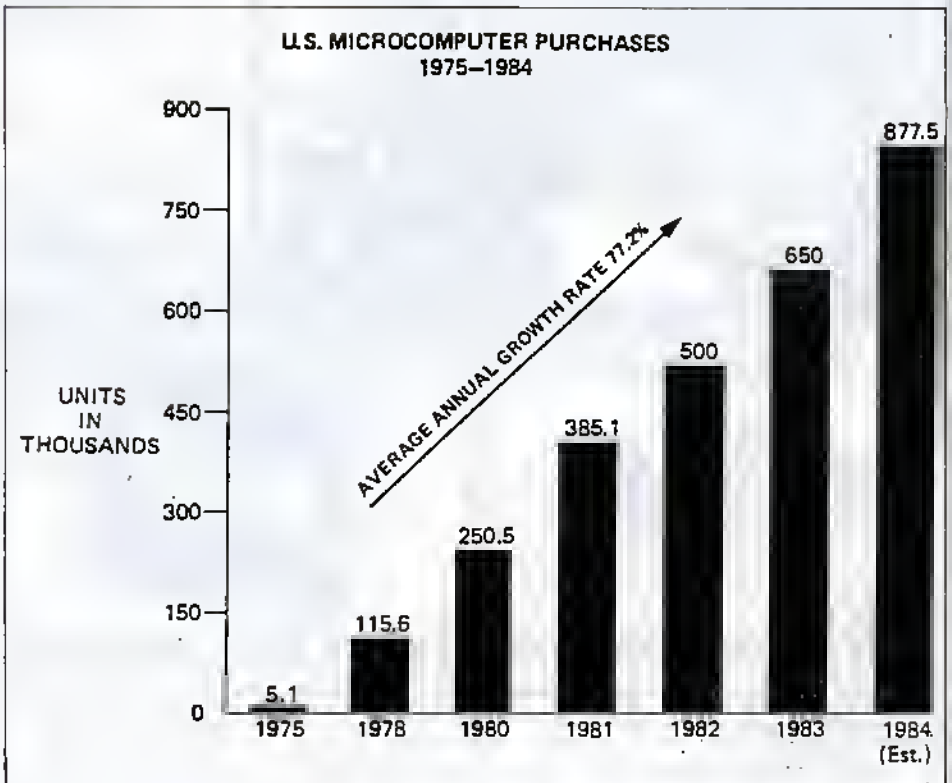
It was evident the computer market was a young person's market, not only from the end users' point of view, but also from the people involved in the industry, he said.

Superbase II here

Unique Systems Ltd has been contracted to provide technical support for a new software product from Precision Software (US) Ltd.

Superbase II software for Apple 2 computers — a new version of the successful Superbase 64 for Commodore computers — comes with a tutorial on audio tape, as well as the usual printed manual.

Unique will provide technical support for Precision products throughout New Zealand, Australia and the Pacific.



Lack of training

Despite their spectacular impact on the computer market, micros have made a very limited mark in US corporations partly because of the absence of training programs for managers, according to a recent survey.

Only a quarter of the 453 companies surveyed used formal training programmes to teach employees how to operate microcomputer equipment and software and only 24 per cent of these companies have seen training materials they approve of.

Less than 15 per cent of the respondents reported widespread use of microcomputers within their organisation, with nearly 60 per cent noting little or no use of the computers.

However, more than 57 per cent of the respondents expected increased use of micros in the next year and 42 per cent have considered using training materials.

The companies surveyed for the international accounting and consulting firm of Arthur Young were among the largest in the USA and represented a broad range of industries.

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120% increase forecast

The latest Arthur Hoby and Associates survey into the New Zealand business microcomputer market (PCs retailing at $3000-plus) forecasts a 120 per cent increase in the market in the next year.

The growth in the market last year (the 12 months to September, 1984) was valued at almost $90 million.

Hoby and Associates says there are now 15,884 microcomputers installed in the New Zealand business market. Of these, 51.5 per cent are stand alone systems (with just over 20 per cent multi-user systems), 59.1 per cent run on eight-bit processors, and almost 55 per cent use CP/M.

The most popular applications are accounting, spreadsheet and word processing. Interestingly, 10.7 per cent of business micro users reported having used pirated software.

First MS-DOS 3.1 net

The world's first network running nder the MS-DOS 3.1 operating system has been implemented by Barson computers in Australia assisted by the New Zealand technical services manager, Tony Krzyzewski.

The system allows multiple users to hook into common file systems. The previous version, MS-DOS 2, was designed for stand-alone operation.

"MS-Net" was installed for the Hornsby Technical Institute in New South Wales — the first institute in the state to set up its own network. All others will follow, each with one or more networks of Apricot personal computers.

Each network will consist of 16 PCs linked to a Point 32 file server made by the Apricot's manufacturer, Applied Computer Techniques, of Britain.

Networks are being set up at the rate of one a week and all 300 machines in the technical institute's order — believed to be Australia's largest microcomputer sale — run MS-DOS 3.1

Macintosh office

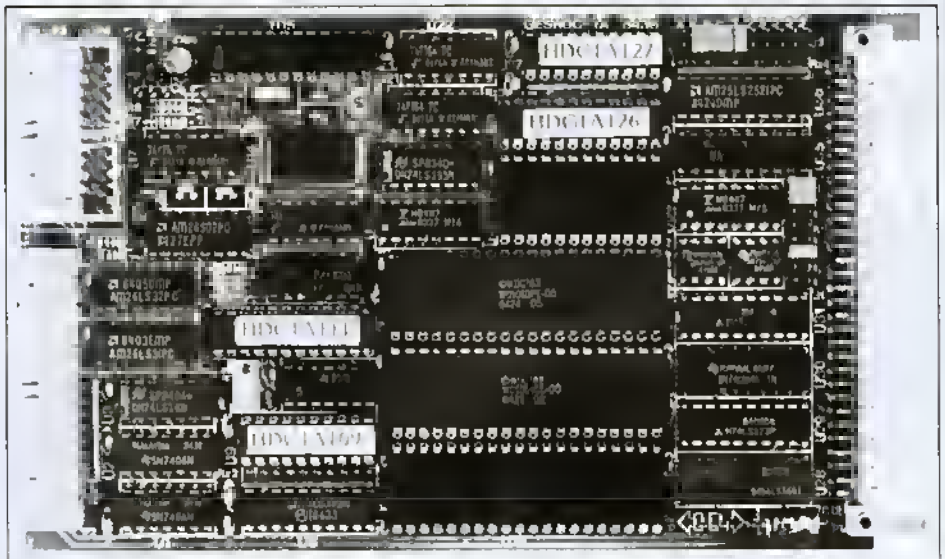
Pursuing penetration into the business market, Apple introduced its Macintosh office to dealers at the annual dealer conference in Rotorua.

As part of this move, two new products have just been released in the USA — the Appletalk personal network, and the laserwriter, a laser printer that provides high quality print. Both products will be available here later this year.

The Appletalk network can support up to 32 computers/peripherals, within a work area of about 1000 feet. The concept behind the design is to provide a network that is low cost, easy to install and use, and powerful enough to interact with other networks.

Apple's US president, John Sculley, reports there are more than 50 companies with product under development for the network. These include hardware devices that connect Apple computers with IBM) PCs, an interface to the Ethernet local area network, gateways to the IBM networks, a UNIX file server and hard disk servers.

The Laserwriter can be built into the Appletalk network and be shared by up to 31 personal computers in a work group. It also has a RS-232 port to connect to other devices. A built-in program that emulates the Diablo 630 IBM and IBM compatible PCs using WordStar or other IBM software can print directly on the laserwriter without software modification.



The Gespac microcomputer board

Kiwi connection

The electronics & instrumentation division of E.C. Gough Ltd (P.O. Box 22-073, Christchurch) is now representing the Swiss Company, Gespac, in New Zealand. Gespac manufactures microcomputer boards in the single-height Euroboard format with more than 90 complementary functions.

It supports the eight-bit MC 6809, Z80 and 8085, 16-bit MC68000, 8088, and PDP 11/70 compatible micro J11, and the 32-bit NS 16032, microprocessors, as well as compatible memories, interfaces, controllers, converters, and accessories.

All boards are compatible with the standard G-64 bus, easily interfaced, non-multiplexed 8/16 bit bus operating in either synchronous or asynchronous mode.

Computers in the past

Anyone wanting to dig up their family roots can enlist the help of the newly-formed New Zealand Genealogical Computer Society.

The society offers members the aid of computer technology to establish and assemble family trees.

Maarten de Vries, who was active in forming the national society, found there were many people throughout the country interested in using computers to trace their history.

A Genealogy Users club has been formed in Auckland and meets monthly (the first Wednesday) at 107 Hillsborough Road, Auckland.

Prospective computer genealogists should contact Maarten de Vries, (P.O. Box 9870, Newmarket, Auckland).

The Commodore 16 was reviewed in the February issue of Bits and Bytes.

The learning machine.

The Commodore 16 is the best first time user machine available.

SUMMARY OF KEY COMMODORE 16 FEATURES

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- High Resolution Graphics — 121 Colours.
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- Full Typewriter Keyboard.
- 40 column Screen Display.
- Price $495.

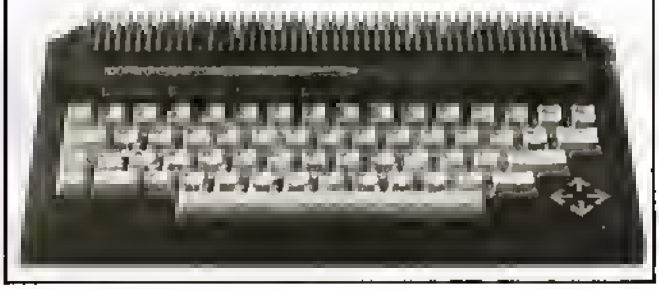
The productivity machine.

The Commodore Plus 4 is the only computer with 4 leading software programs built in. Word processing. Graphics. Spreadsheet and File management. With the touch of a key go from one program to another.

Programs that are not only built into the computer, but built into each other.

SUMMARY OF KEY PLUS 4 FEATURES

- 64K Random Access Memory (60K user).
- Full Typewriter Keyboard.
- Sophisticated Basic Language.
- Built-in Software.
- Split Screen and Windowing Capabilities.
- Price $995.



The new Commodore 16 and Plus 4 are now available anywhere on this page.

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Selcom Electronics, Panmure. ph. 577-199.
Supatech Electronics, Mt Eden.
ph. 605-216.

PUKEKOHE
Pukekohe Computers. ph. 87-003.

THAMES
James Electronics Ltd. ph. 86-893.

WAIHI
Stevens Radio Service Ltd. ph. 8207.

HAMILTON
Computer Rentals. ph. 79-442.
Computer Room Ltd. ph. 80-781.
Dollar Save Compul-a-Centre.
ph. 393-545.
Emstem Scientific Ltd. ph. 81-969.

CAMBRIDGE
Stopwatch Computer Services. ph. 3624.

ROTORUA
Brian Hamilton Ltd. ph. 87-146.
Channel 5. ph. 89-164.
Powercorp Centres Ltd. ph. 479-172.

TAURANGA
Communication House HZ Ltd.
ph. 82-857.
Powercorp Centres Ltd. ph. 81-009.

TE PUKE
Phil Booth Television Audio.
ph. 37-882.

WHAKATAHE
Whakatane Appliances Ltd. ph. 85-054.
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GISBORNE
Microtech. ph. 88-990.
Personal and Business Computers
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HAWKES BAY
Andas Centre, Hastings. ph. 82-089.
H.M. Winlove Ltd., Waipukurau.
ph. 88-739.
Timms Business Equipment Ltd.,
Napier, ph. 54-250.

KAWERAU
Dennis Jackson Ltd ph. 7030.

TOKOROA
Computer Centre. ph. 64-900.

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King Country Computing. ph. 8071.

NEW PLYMOUTH
Einstein Scientific Ltd. ph. 82-858.
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WANGANUI
Stewart Appliances. ph. 52-700.

PALMERSTON NORTH
Einstein Scientific Ltd. ph. 64-108.
Viscount Electronics Ltd. ph. 86-696.

PARAPARAUMU
Kapiti Independent Business
Machines Ltd.
ph. 87-351.

MASTERTON
Masterton Computer Centre. ph. 89-963.

WELLINGTON
Computer Experience. ph. 736-777.
Disposed Data Network Consll.
ph. 697-548.
Einstein Scientific Ltd. ph. 851-055.
Home Entertainment Centre Ltd.
ph. 661-145.
Ice Clear TV Services. ph. 282-475.
L.V. Martin and Son Ltd. ph. 724-356.
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Craw Video Services Ltd. ph. 6200.

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G.T. Computing ph. 797-811.

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Coast Business Machines ph. 5264.

HOKITIKA
Graham Electronics Ltd. ph. 384.

TIMARU
Cliff's Business Equipment. ph. 44-241.

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Smith and Church Electrical Ltd.
ph. 89-019.

QUEENSTOWN
Video Electric. ph. 1368.

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Ken France Electronics Ltd. ph. 8021.

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Eclipse Radio and Computers. ph. 778-102.

GORE
Eastern Southland Computers. ph. 5710.

INVERCARGILL
OES Business Systems Ltd. ph. 84-448.

commodore

Everywhere you go there's a Commodore.

New Commodore computers

Not content with releasing two new computers this month (the C16, reviewed in the February issue and the Plus 4, to be reviewed soon), Commodore Computers has disclosed plans to release at least two more new computers this year.

Surprisingly, one will be an IBM PC compatible computer, manufactured in Germany. No other details are available at this stage but Commodore promises it will be priced significantly below the IBM PC.

The other definite (or as much as anything can be definite when you are dealing with Commodore International) is the C128, a successor to the C64. The C128 will be able to operate in three modes:

- Commodore 64 mode — running in this mode the C128 will be 100% compatible with existing C64 hardware and software, so that the huge support base built up for the C64 won't be wasted.
- CP/M mode — This allows the C128 to run any of the software programs written for use with the CP/M 3.0 operating system.
- C128 mode — This mode features Commodore's most powerful version of BASIC. Combined with the standard 128K of RAM, BASIC 7.0 allows the use of more than 140 commands, statements and functions.

The Commodore 128

To allow it to operate in three modes, the C128 contains three processors — a 6510A (as in the Commodore 64), a Z80A for CP/M and a 8502 (6502 compatible) for the 128 mode.

The C128 comes with 128K of RAM (although it obviously uses only 64K when operating in C64 mode), expandable to 512K and can display either 40 or 80 columns.

Commodore estimates that C128 owners will immediately have more than 6000 C64 and CP/M programs to choose from and a growing number of programs written specifically for the 128 mode.

The C128 is not expected to be available in New Zealand until July and no pricing is available yet.

Other models Commodore may release this year include a portable with LCD screen (unveiled in the USA in January but unlikely to be sold in New Zealand) and the Macintosh-like Amiga computer (see Micro News, October, 1984, *Bits & Bytes*).

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Sperry Information Systems and More magazine are sponsoring a Businesswoman of the Year Award. The annual award will carry a $10,000 prize.

Sperry's general manager Paul Kimberley, said his company was co-sponsoring the award because it felt women should have greater recognition for the role they played in business.

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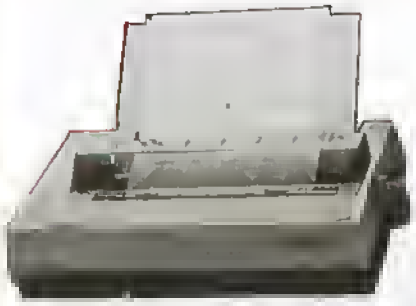

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SINCLAIR QL

The considered facts

By Gary Parker & Ian Hemmingsen

The Sinclair QL

The Sinclair QL has without a doubt been subject to more comment in the last few months than most computers get in their lifetime. Overseas reviewers have been sharply divided in their opinions, and conflicting information has appeared as magazines tried to be the first to review the machine by testing early versions. But now with the completed QL about to be released in New Zealand, we present the facts.

The QL is a complex computer, and you cannot expect a complete evaluation from a day's trial. So Ian Hemmingsen and I got together to write this review. We have both used the QL on and off for the last few months, and in addition, I contacted two QL owners who have been using privately imported models for some time, to hear their opinions.

The Sinclair QL comes in an angular black case, unusually wide and slim — 47cm wide, 14cm deep, and 4cm high. To the right of the keyboard are two microdrives. An external power supply, TV cable, three plug-on feet, a wallet with four business programs, a user's guide, and some blank cartridges, are all supplied.

The manual, which comes in a voluminous black ring binder, fills most of the QL's box and weighs more than the computer! It contains sections headed: beginner's guide, keywords, concepts, QL Quill, QL Abacus, QL Archive, QL Easel, and information. To our dismay, it began with seven pages of errata, but our manual was several months old. Let's hope New Zealand manuals will be improved.

For this reason, we won't dwell too much on our manual except to say that while it seems well written, it is a little disorganised and lacks an index, making information difficult to find. Information on QDOS (the QL's operating system) is available as an extra in the QDOS programmers manual. Reading a pre-released version revealed a lot of useful information for the advanced user.

The QL keyboard uses 65 full-travel black plastic keys with white lettering. There is a full-size spacebar and five function keys. In short, it looks fairly much like most "real" keyboards. However, the keys are all in the same plane instead of being stepped, and without the three shaky feet which "fit" under the computer, the keyboard lacks slope.

Keys have to be pressed straight down to register consistently, and fast typing makes them clatter, rather like some Apple keyboards. We felt the keyboard was reasonable, but not up to the standard of, say, the BBC. A home user would be happy with it, but a professional typist using the QL for word processing might find it a little irritating.

When turned on, the QL asks the user to press F1 or F2, depending whether a monitor or TV is connected. If F1 is pressed, the QL goes into "monitor" mode, where the screen is divided into two halves vertically. The white left half has 40 columns and 20 lines for displaying the program listing. The red right half has the same format for program output. At the bottom is a five-line, 80 column area for input. This mode goes slightly off the edges of the screen if used with a TV — which is a

The QL hardware

The QL uses two processors, an eight-bit Intel 8049 for input/output operations such as keyboard scanning, and a 32-bit Motorola 68008 as its CPU. Even the 8049 is more sophisticated than the other eight-bit processors which run home computers. It can be thought of as a complete computer in itself, as it contains 2K of RAM and 128 bytes of ROM built in.

The 68008 has been criticised as not being a true 32-bit processor. It is the cheapest of Motorola's 32-bit 68000 family, although it still costs a lot more than the familiar Z-80 or 6502. Internally, it is a true 32-bit processor, but it has only an eight-bit data bus. So it works like a 32-bit, except that it accesses memory like an eight-bit. You get the power of a 32-bit processor, but at slightly reduced speed. You can add "only" 1 Megabyte (1000K) of memory to the 68008. Compare this with 64K for eight-bit processors!

For a 32-bit processor, we were disappointed to find the QL's SuperBASIC works to only eight significant figures. However it can handle numbers to the ludicrously large power of 615. To put this into perspective, the distance to the star, Sirius, in millimetres, is only in the order of the 20th power.

The QL software

The four business programs which come with the QL are claimed to be as good as anything on the market, and PSION is said to be considering marketing them for the IBM PC. Just how good are they?

Quill, the word processor, was the program I spent the most time with. I found it exceptionally powerful, and quite user-friendly, considering how many commands there are. I haven't used expensive professional word processing programs enough to accurately compare Quill, so I asked a QL user who also uses WordStar on the Apple. He rated Quill very good, but felt it didn't offer enough advantages over WordStar to make it worth changing. His main criticism of Quill was the length of time required to load and save long documents on the microdrives.

So it seems Quill is up to professional standards except for microdrive access time. QLs sold in New Zealand will have a later and slightly faster version of Quill than I used.

Abacus, the spreadsheet, definitely seemed superior to other spreadsheets I have tried, mainly because it is more user-friendly, making use of English words more than code letters and numbers. However that does mean a little more typing is required. Abacus has all the usual spreadsheet commands as well as some novel ones.

Unlike the other programs, the database, Archive, requires some programming knowledge to make full use of its facilities. Procedures to tailor the program to the user's needs are written in a language similar to SuperBASIC. Archive has all the sorting and searching facilities you would expect of a database, plus good calculational facilities.

Easel, the business graphics program, can draw any type of graph I could think of trying — bar, line, pie, kite, and every variation in between. It shows off the QL's colourful high-resolution graphics to full effect, but of course you'll have trouble reproducing it on a printer — perhaps Easel's main limitation. Sinclair suggests photographing the screen.

So PSION has produced an excellent set of programs, well up to professional standard, but their effectiveness is reduced by having to use the slow microdrives. This is aggravated by the software using overlaying techniques to conserve memory, which require frequent drive access. This will limit the programs' appeal to professional users.

• Examples of what you see with the QL software (top to bottom): QL Quill word processing; QL Abacus spreadsheet; QL Archive database management; QL Easel business graphics.

pity since 80 columns are just about readable on a TV.

If F1 is pressed, the QL goes into "TV" mode, where the screen has one 40-column area covering the whole screen, with a five-line area at the bottom.

These areas, termed windows, are completely software-controllable. You can have several windows on the screen at one time, each acting rather like an individual screen. A window can be any size and shape, and occur anywhere on the screen. There is a very comprehensive set of commands connected with windows, including smooth scrolling in any direction, flashing, highlighting, and much more.

In high-resolution mode, the QL offers 512 by 256 pixels and four colours. PSION's QL Chess provides a stunning demonstration of this mode. Realistically shaded pieces glide around a board shown in three-dimensional perspective. The superb display must be matched by the program's playing ability — it tied for first place in the 1984 world microcomputer chess championships. QL Chess is also the only program I have seen get five stars in the British Your Computer magazine's software reviews.

Low resolution mode offers 256 by 256 pixels and eight colours. Four stipple patterns are also available for intermediate hues. Surprisingly, I found these to be clear and haze-free even on a TV. The picture quality on a TV is very good, better than most computers. However this may depend on the quality of the modulator fitted in the QL for New Zealand use. The QL we used had the original UHF modulator modified for New Zealand's VHF transmission.

SuperBASIC

To call the QL's resident language SuperBASIC is hardly descriptive. Not because it isn't super, but because it is not BASIC. While it does include BASIC commands, these are integrated into a much more powerful language so flawlessly that SuperBASIC does not seem to be an extended BASIC at all, but rather a newer improved language from the ALGOL/PASCAL/C family.

The language has so many features you'd really need a book to learn it properly. The QL manual covers all the commands, but I found I was writing SuperBASIC as if it were BASIC with a few extra commands until I read more about the philosophy of the language in Boris Allen's scholarly (but clear) book, *The Sinclair QL Companion*.

To give some small examples of SuperBASIC's similarities to

PASCAL, SuperBASIC's SELECT is a more sophisticated version of PASCAL's CASE statement, and its IF-ELSE-END IF is an improved version of PASCAL's IF-ELSE. SuperBASIC's looping structures can all be terminated with END or NEXT (depending on exactly what you want to occur), which is more logical than BASIC and very much like PASCAL's BEGIN-END.

Also in common with PASCAL, SuperBASIC's functions and procedures are called simply with the name of the function or procedure, so a program can be made to look a little more like English. Use of the much despised GO TO and GO SUB should never be necessary in SuperBASIC, although they are available.

To make programs easier to read, recognised keywords are automatically converted to capital letters in the listing. This allows keywords and procedure names to be distinguished. For example "rem" becomes "REMark" in the program listing.

Conflicting reports have appeared about SuperBASIC's execution speed. Unlike most machines, SuperBASIC does not slow down as programs get longer. Because of this, short benchmark programs are misleading. A moderately sized program on the QL will run faster than on most BASIC computers.

So SuperBASIC is very impressive. It is similar to the much acclaimed BBC BASIC, except that is more unified in structure and so does not seem to be just an extended BASIC. But although Sinclair has obviously put a lot of thought into the language, the interpreter shows signs of being hastily written. For example, many commands are tediously long to type in. To get a microdrive catalogue, for instance, you have to type:

```
dir mdv1_
```

That trailing underscore is an unnecessary shifted character. Editing a line requires at least six key presses, compared with two on the Spectrum. A further example is the ridiculous parameters of the BEEP command. The length of the beep can range between 0 and 32767. However 32767 produces a maximum beep length of only 2.4 seconds!

Other features of SuperBASIC include Turtle Graphics, arc circle and ellipse plotting commands, block and fill commands and a real time clock.

Sinclair has termed the new operating system which runs the computer QDOS. Early advertisements claimed the QL was capable of multitasking (running several programs at once). The QDOS programmers manual reveals that QDOS has a powerful multitasking system, but this seems to have been poorly utilised by SuperBASIC. Multitasking is only available via machine code at present. Perhaps future software will use this power more successfully.

Connections

Unlike previous Sinclair offerings, the QL is well supplied with external connections. Along the back are two network ports, a power socket, a monitor socket, a TV socket, two RS-232 ports, two joystick sockets, and a ROM cartridge port. On the right side is a socket for connecting more microdrives, and on the left, an expansion slot for connecting extra memory and other hardware.

The network ports can be used to connect QLs together much like the BBC Econet. Early advertisements said the net would allow QLs and Spectrums to be connected. Well, you can connect them, but they won't communicate! Future software may be able to solve the incompatibility problems.

The power and monitor connectors are unusual, and so are the joystick and RS-232 ports, which use a presently difficult-to-obtain plug system. The plug is being adopted by British Telecom, however, so it should become more readily available. Although joysticks do not require an interface to be connected, you will need a plug adaptor. We used one ordered from England for £6. Although we dislike the plugs for being so unusual, we must admit they work well. They are easy to remove, yet very firm when in position.

A limitation of the RS-232 ports is that they cannot operate at different baud rates simultaneously. To overcome connection problems with other devices, Sinclair has wired each plug differently. One acts as a data terminal (DTE), the other as a modem terminal (DCE). However in practice, connection to most equipment still requires considerable effort.

The omission of a Centronics interface is unforgivable, since Centronics is now undeniably the standard for printers in the lower price range. A Centronics interface is available from another manufacturer, for an extra £50. We have seen it working. It is the size of a matchbox, and contains only three integrated circuits.

The ROM port will allow cartridges to be plugged into the QL. These are expected to contain other languages,

The shootout: QL v BBC

Sinclair obviously designed the QL as competition for the BBC, and the two have many similarities. Which would we prefer?

Ian Hemmingsen: The QL has some excellent features, but considering the market it is aimed at, it has what could be considered serious faults. The lack of a Centronics and floppy disk interface are glaring examples. The BBC may be based on old technology but it has a better keyboard, and at present, offers a greater range of interfaces and expansion possibilities.

Sinclair seems to have an obsession with miniaturisation, and typically, there is no room for internal expansion in the QL, so add-ons will dangle around outside. The BBC with floppy disks is cheaper than the QL with hard disks, and a fully expanded BBC with a Z-80 second processor with CPM allows access to a wide range of software. It will be interesting to see what other manufacturers will produce for the QL or in competition to it. Unless independent manufacturers do for the QL what they did for the Spectrum, I would have to opt for the BBC at present.

Gary Parker: Going by the hardware alone, the QL leaves the BBC for dead. But I have been using a BBC for some time, and I am very impressed with it. Overall, the BBC operating system seems slightly more professional than the QL's. However I really like SuperBASIC, and could never be completely happy with BBC BASIC knowing how elegant SuperBASIC is.

I'm not impressed with the microdrives, but since they are included in the QL for the same price as a BBC alone, they could be considered a freebie. The BBC's disk drives are excellent, but they make the BBC considerably more expensive than the QL. Several manufacturers claim to be designing floppy disk interfaces for the QL, so before long, QL users should have the disk option.

What really cripples the BBC in my view is the lack of memory. The BBC may have excellent graphics, but we never get to see them because they leave hardly any room for the progam! The QL has as much memory just for graphics alone as the BBC has in total, so commercial programs must be better on the QL. A BBC with all the trimmings such as a second processor would be better, — but you could have three QLs for that price. Even though I'd miss some of the BBC's features, I'd go for the QL.

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and perhaps "megagames".

The RAM expansion port is designed to accept a yet-to-be released 512K memory pack. Removal of the cover reveals that the connector is recessed 8cm into the computer, so most of the expansion unit should fit internally. Another manufacturer already offers a 128K RAM pack, two of which can be fitted internally to raise the QL's memory to 384K.

The microdrive extension port allows up to six extra microdrives to be added, bringing the total storage capacity up to 800K. Spectrum microdrives cannot be used.

The microdrives

The two built-in microdrives are intended as a cheap alternative to disk drives on the QL, although they are not as fast. When I first used a QL, I compared the speed with the Spectrum tape format and the Commodore 64 disk drive, and it seemed reasonable. But since then, I have been using the fast BBC drives, compared to which the microdrives are intolerable. It takes up to a minute to load each business program, and just loading the HELP pages when using the programs can take half a minute. Who wants to ask for help and then have to wait for that long? We feel the microdrives' slowness severely limits the QL's usefulness as a true business machine.

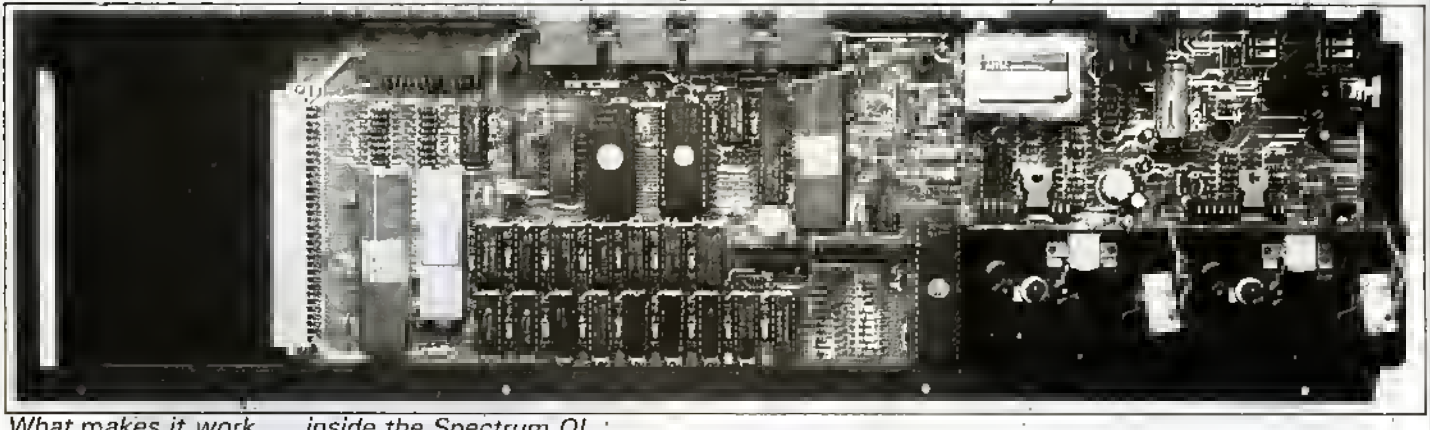
In addition, we were disappointed with their realiability. Perhaps we used the only two bad QLs ever made, but we found that cartridges saved on one drive would not work on another, and on one machine, microdrive 2 never worked consistently. That could just be a matter of adjustment, but that sort of problem doesn't occur with disk drives. We feel that while microdrives may be acceptable for home use, business use demands complete reliability and fast access which the microdrives simply don't offer. Sinclair should have provided a floppy disk interface.

The other storage medium which the QL will offer once Sinclair completes the interface is hard (Winchester) disks — disk drives with a non-removable disk capable of very high storage capabilities. But a Winchester will cost considerably more than a QL. Even though Winchesters offer high reliability, business users still make back-up copies of them. To back up a 10Mb Winchester on a QL would require 100 microdrive cartridges, and take over eight hours! Hard disks seem an odd choice, unless Sinclair intends to market some very cheap ones. Realistically, anyone who needs the use of a Winchester should be prepared to pay rather more for a computer.

Overall, the Sinclair QL is a computer of contrasts. It has some very good and some not so good features. The hardware, memory size, graphics, SuperBASIC, and software packages are excellent. Some aspects of the microdrives, keyboard, and interpreter are not. Potential QL buyers will have to evaluate which features are important to them, and decide accordingly. We feel that while the QL may not quite be a match for computers many times the price (as Sinclair has claimed), it certainly represents exceptional value for money.

Microcomputer Summary

Name:	Sinclair QL
Manufacturer:	Sinclair Research
CPU:	Motorola 68008 32-bit, Intel 8049 8-bit
RAM:	128K bytes
ROM:	48K bytes
Display:	User selectable up to 85 columns 25 lines
Graphics:	4 colours with 512 x 256 pixels, 8 colours with 256 x 256 pixels
Language:	SuperBASIC highly extended BASIC
Keyboard:	Full typewriter style keys over membrane, 65 keys
Audio:	One channel BEEP with considerable user control
Mass Storage:	Two built-in 100K microdrives using continuous tape loop cartridges
Input/output:	2 joystick, 2 RS-232C, RGB monitor, VHF TV, ROM cartridge, 2 network, RAM expansion, microdrive expansion, power input
Options:	Many yet to be released
Price:	$1695
Reviewers' rating (5 the highest):	Documentation 3, ease of use 4, language 5, expansion 4, support 5, value for money 5



What makes it work . . . inside the Spectrum QL

World first

The Philips P2000 C has become the world's first portable micro-computer available with a 20MB internal hard disk.

The disk option can be specified when buying or as an upgrade for existing P2000 users. One of the unit's two 640K floppy disk drives is exchanged for a Seagate 20MB integrated 5.25in Winchester technology hard disk.

The initial purchase price for a PC2000 C, equipped with the 20MB hard disk, is $12,500, and the upgrade cost is $7000 (both including tax).

Buy books this month

TANDY 1000

A low-priced 16-bit contender

By John Slane

Tandy has become the latest contender on the local scene for bedrock price 16-bit computers with its Model 1000. For $4085, you can have a one disk unit with green screen monitor and a basic integrated package called OeskMate which does word processing, spreadsheet, filing, communications and appointments. Standard features include colour, sound, high-resolution graphics and 128K RAM. For the people who enjoy games, a pair of joystick ports is provided — right on the front of the processor unit in the most sensible position.

I/O includes video and audio, RGB, RS-232C and printer parallel. The latter is an edge connector as used on other Tandy models such as the III and the 4, and is a notoriously difficult socket to disconnect from. It's time Tandy abandoned this type of connector for the more conventional and practical centronics socket. I was pleased to see a hard reset button on the front of the processor cabinet (although, surprisingly for me, I never had to use it!).

The complete unit is quite compact and well presented in the now common colour co-ordinates of cream, grey and black. The supplied monochrome monitor matches well.

The keyboard follows the Tandy pattern and is better than average quality. It has separate cursor keys (in a triangular placement) and LEDs on CAPS and NUM LOCK. Keys function positively except that the RETURN key won't accept being pressed off-centre — obviously not designed by an engineer familiar with typing. The CAPS LOCK is on the left-hand side near where it should be. Twelve function keys are placed along the top and OeskMate uses all of them.

On power-up, the system searches drive A and recognises the absence of a disk. Striking any key when a disk is in place starts the read process. Typically, the Model 1000 is a failsafe, comfortable user-friendly system. That must be why I didn't have to use the reset button.

The cooling fan is whisper quiet. Disk operation is efficient. However, disks have to be removed before power-down to avoid the risk of pulse damage.

The Tandy 1000

The major criticism would have to be very poor text presentation on screen. When using a colour monitor, the text is fuzzy and unnecessarily hard to read. This problem is shared by some other computers (for example the Sanyo 755). The availability of colour does nothing for easier reading of text on the screen.

The monitor I used with the review model was standard green screen and at least the text was sharper. But again, as with some other cheaper computers I have reviewed, the character font is a poor example of what is possible. Compared with all the other current models in the Tandy range (for example the 4 and 4P, 1200 HO and 2000), the text presentation on the 1000 is quite inferior and will be likely to turn off many potential buyers of, what is in other respects, a very attractive package.

The MS-OOS version appears much as standard although the Tandy manual was not available to confirm this. BASIC is a very full version of GW-BASIC (1984) which includes advanced user statements such as ENVIRON for modifying string tables in BASIC, IOCTL for controlling a device driver, and NOISE for generating specific sounds of that general type.

However, I was startled to see that on entering BASIC, only 21,661 bytes were available. Having been used to seeing anything up to 61K available, I was at a loss to know why (with 128K RAM) the space for

BASIC was so miserly. Then I discovered the screen display was page mapped and more than 16K set aside for screen memory as standard. Together with a comprehensive 8ASIC, plus this video memory, the BASIC user has very little room in which to manoeuvre. What a pity the designers didn't make better use of the directly addressable 128K.

Depending on the screen mode selected, as little as 2048 or as much as 32,768 bytes are required for video pages, so the user has some control over the bytes available in 8ASIC.

BASIC programs written in IBM format ran without problems, but where graphics were involved, these ran very slowly. Obviously some design compromises have been made in the interests of economy since you would normally have expected the 8088 chip running a standard 4.77Mhz would have been more efficient with graphics. Colour fills are especially slow.

Although the review unit had not been converted to 230v, the screen was absolutely steady without flicker even during scrolling. As with the graphics, writing to the screen is very slow — 1000 lines of text (with line numbers) took 3m 44s to present. That's about the speed a mere human can count! You might agree a $4000 computer should do better.

Microsoft 8ASIC provides a good, workable on-screen editor. On the Tandy, the cursor changes shape when the insert mode is selected. A nice feature.

My benchmark tests showed the Tandy 1000 is generally accurate with its arithmetic (finding primes) and of average speed where only calculation is required. Anything involving writing much to the screen suffered by the slowness of that procedure.

Speed of disk access was satisfactory. But during the process, the clock timing slowed considerably whereas up to that point it had been maintaining commendable accuracy. This needs to be borne in mind if much use is to be made of the alarm facility provided with DeskMate. A moderate amount of disk access could make you late for your next appointment.

The publicity claims "90%" IBM compatability. In my opinion this factor is becoming less of an issue when there are so many copies of the I8M-PC out in the marketplace. The third party software houses are now careful to write programs not exclusively specific to the I8M-PC — that is, they will run on the I8M and a wide range of IBM work-alikes. Quite often the software is advertised as compatible with a stated group of IBM clones.

All this means is that if there is a piece of well-known software you want, there is every likelihood there is a version which will run on your MS-DOS computer. (The Wang PC is an exception to this, but Wang will sell you an IBM emulator card so that its machine will do everything the IBM PC will do.)

As this review was written over the holiday period, I did not have my usual access to sample I8M software, so I am unable to report on specific applications. However, if a well established company such as Tandy claims 90% compatability, that is probably reassurance enough — along with your own requests to a distributor to demonstrate any particular applications you intend to use.

The DeskMate package includes five utilities. It opens with an interesting and practical menu format and selection of the required application is readily achieved.

As a word processing utility, TEXT comes without bells and whistles, but is a generally sound program. It will do most of what the general letter writer and report writer needs.

The program will not display video lines longer than 79 characters so you don't always "see what you get". On the other hand, wordwrap is fully automatic so there's none of that nonsense of manually reformatting paragraphs after inserts and deletions.

The whole of the text being composed is held in memory. This will fairly quickly put a limit on the maximum size available for a document. However, new files can be opened and then printed using the merge facility to achieve documents of any length. I guess the definitive novel you might be wanting to write could, in fact, be done on DeskMate — provided you don't mind numbering all the pages by hand!

Having all text in memory gives the considerable advantage that scrolling through the document is fast, smooth, and with no breaks for disk access.

I wrote this review using Text and found no significant problems apart from the fact that I didn't like the ugly character font and the low resolution letter matrix. In the short time I had the review machine, I wasn't able to figure out how to get white-on-black text. This requires considerable juggling with combinations of four function keys while the DeskMate menu is on screen. These keys actually select colour combinations, but the process is rather obscure when using a monochrome monitor.

Filer is a very effective yet modest program to handle reference information, provided you don't want any arithmetic done on fields. Label formatting is well done, and sort and finding is very comprehensive. No indication is given in the manuals or on the screen as to the maximum capacity of files. I suspect the

Microcomputer summary

Name:	Tandy 1000.
Manufacturer:	Tandy Corporation, Fort Worth, Texas.
Microprocessor:	8088 16-bit with 8-bit data path.
Clock speed:	4.7MHz.
Memory (RAM):	128K, upgradable to 640K.
Input/output:	RS-232C, RGB, video, audio, parallel printer, joysticks (2), 360K disk drive.
Keyboard:	90 key, numeric pad, 12 function keys, separate cursor.
Display:	24 x 80, 40, or 20; 6 screen modes in BASIC.
Graphics:	Up to 640 x 400; up to 16 colours depending on screen mode selected.
VDU:	Optional; TV may be used.
Languages:	MS-DOS, GW-BASIC supplied.
Sound:	Inbuilt speaker; full sound control under software.
Bundled software:	Spreadsheet, word processing, filing, Telcom, Calculator and Scheduler (i.e. "DeskMate").
Cost:	$4085 with green screen monitor, and 1 drive; $4950 with monitor, 2 drives, and SYBIZ accounting package.
Options:	Joysticks, light pens, printer interfaces, monitors.
Reviewer's ratings	(1 — 5, 5 being highest): Ease of use: 4, Documentation: 4 (of what was available at this time), Languages: 5, Support: 5, Expansion: 4, Value for Money: 4+

(Review machine supplied by Computer Advances Ltd, 182 Great South Rd, Auckland 5).

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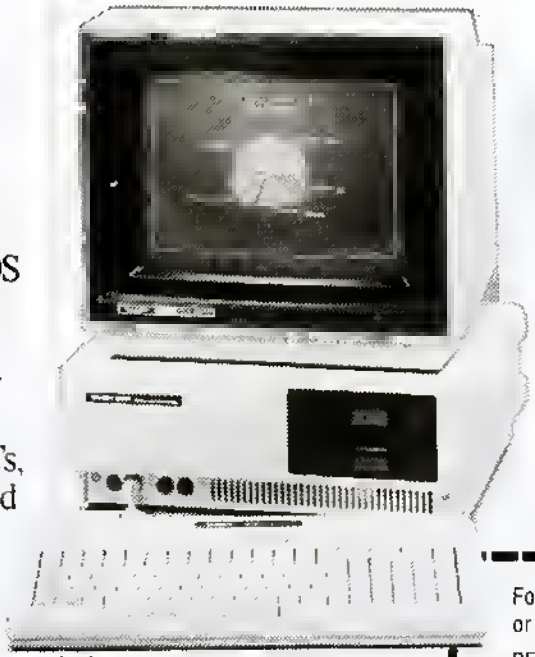

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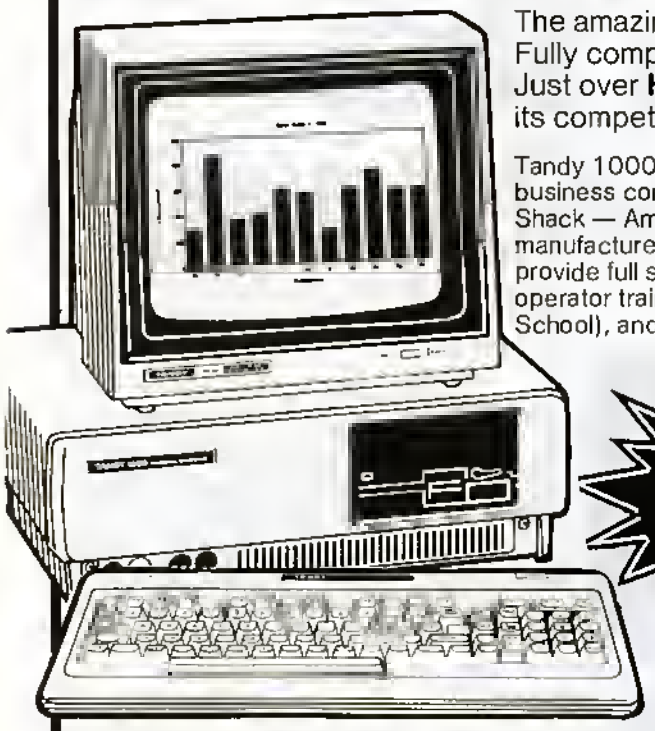

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HARDWARE REVIEW

limitation may be governed by available RAM since it appears the whole of the file is loaded into memory for any required processing.

Worksheet is quite a useful spreadsheet — again fairly basic. However, individual columns can have different widths set — a feature not found on some much more elaborate spreadsheet programs. Calculating and BREAK redraw the whole spreadsheet which can slow things up somewhat.

Calendar, an electronic calendar/diary, is probably more of a gimmick than a desirable necessity. The "find" parameters could be of some use. My personal preference is a conventional diary, although the Tandy version will impress your visitors.

Some worthwhile uses might be found for the Mail message recording facility, but probably only if the computer is used by several management operators on a regular schedule. Otherwise it's just another gimmick.

Telcom requires an appropriate modem and would be of interest when bulletin boards become more readily available. The utility can also be used to communicate with other computers, say in the same building, by direct lines.

Purchasers of the two-disk version of the Tandy 1000 will get (for $4950) the SYBIZ accounting package claimed to be suitable for New Zealand small business conditions, but not available for review.

In most respects, the Tandy 1000 is a well-presented and well-functioning package at what is obviously an attractive price for people keen to get into the 16-bit field. I found the review unit thoroughly reliable and easy to operate over the short period I had it.

I have discussed the relevance of colour in my review of the Sanyo 755 *(Bits & Bytes, February 1985)*, and the same comments apply to the Tandy 1000 if the colour monitor option is being considered.

Where I have commented on slowness of operation, this is just in relation to other machines I have worked with (generally at a higher price), and will not be a serious disadvantage to many users.

The matter of whether the text appearance is acceptable will finally have to be a judgement made by each prospective purchaser. If you can live with the Tandy screen, then the 1000 is one of the machines you will want to look at seriously. It could be good value for money.

TCM BOARD

Built for the engineer

By Peter Ensor

Who says reinventing the wheel does not pay? Delphi, in connection with Databank, has made available a single board CP/M computer system which Databank first proposed and now uses in-house.

One thing this computer isn't however. It is not a consumer product. It is promoted as a board for the engineer and some technical knowledge is required to understand the documentation.

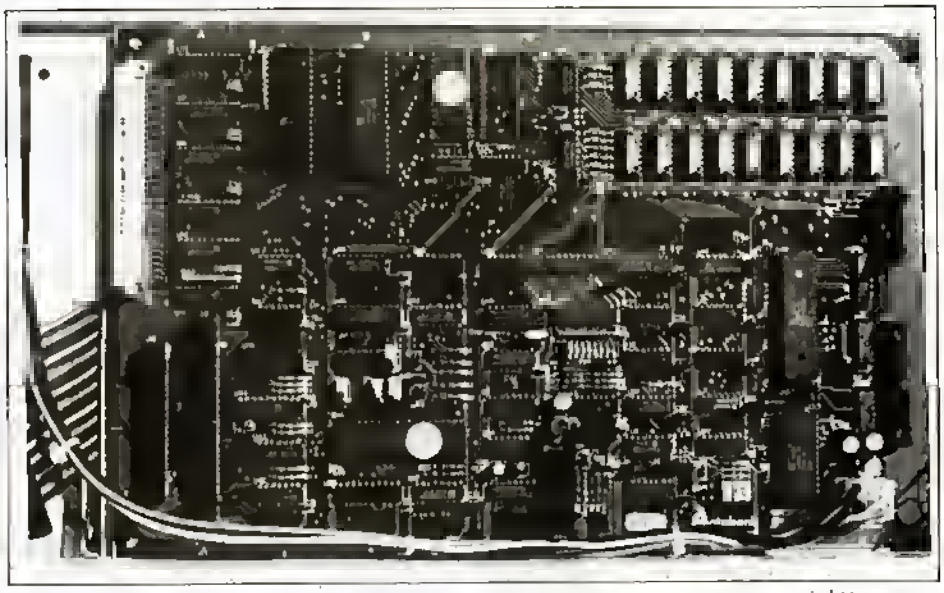
And Delphi will not be selling built-up systems; it will be selling built-up boards. The boards will be assembled and tested because of the large number of through holes on them.

At 216mm x 340mm, the board is the same size as an eight-inch floppy disk drive. The power requirements are +5VDC at 1.7A and ±12VDC at 100mA max. The board also produces a 50Hz clock derived from the mains frequency, and a 6–9VAC supply is required for this option.

The main brain on the card is a Z80A at 4MHz complemented with up to 128K of memory. This memory is nine bits wide, as parity checking is implemented as standard. Up to 32K of ROM can be overlaid on this.

Extra support is provided by the use of a DMA (direct memory access) chip to speed up input/output as well as memory management. A CTC (counter timer circuit) chip is used to provide vector interrupt facilities as well as an interrupt for the real time clock.

Available input/output consists of two full duplex RS-232 serial channels using a Z80A SIO (serial input/output) device. Each channel is independently programmed for baud rate as well as SIO standard protocols.



The TCM board.

The floppy disk controller uses both 34 and 50 pin connectors. This allows five and eight-inch drives to be mixed in any combination to a maximum of four. Double-sided drives and double density formats are also supported.

A 64-pin connector on one side of the board allows access to the full Z80 bus. Delphi produces an interface card that converts the expansion interface to a STD bus to allow prototyping.

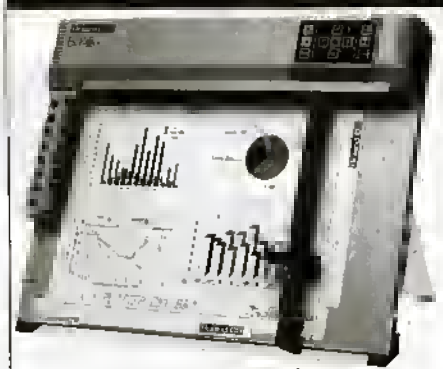
The final connector on the board is for the front panel. The front panel is used for displaying the power on and status LEDS, as well as providing four sense inputs and a manual reset button. The status LED is used mainly to display the results of the diagnostics the system performs on

Microcomputer summary

Name:	TCM.
Manufacturer:	Delphi Industries, Auckland.
CPU:	Z80 at 4MHz.
RAM:	128K with parity checking.
ROM:	32K.
Input/output:	34 and 50 way connectors for the disk drives; two RS-232 serial ports; front panel, Z80 expansion bus.
Operating system:	CP/M and its derivatives.
Cost:	$907.41 including documentation and CP/M 2.2.
Power required:	1.7A at 5VDC: 100mA MAX AT ± 12VDC; 6–9 VAC OPTIONAL FOR 50Hz CLOCK.
Extra features:	DMA chip; interrupt driven real time clock; self-test diagnostics.
Options:	STD bus adaptor $267.70 plus sales tax SASI interface.

Reviewer's ratings (5 the best):
Documentation 5; Ease of use 3; Value for money 5; support 5; expansion 5.

XY PLOTTERS



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start-up and, if enabled, on cold boots.

The diagnostics are very comprehensive. They test all the main system modules such as the CPU. DMA controller and serial interface, as well as making the standard RAM and ROM tests. Obviously, these tests can go only so far but they will identify a major system fault before the operating system is loaded.

In addition to these power-up tests, two more may be selected.

The first is a loop test for the serial interface. This requires a test plug to be attached to the board connectors so that the characters which are sent can be read back into the input registers.

The second is a welcome addition to the line-up. It is a continuous testing of the system to find those elusive intermittent faults.

Repair of the board is made easier by use of signature analysis. The system has been fingerprinted by the use of more than 90 signatures of different parts of the system. (Signature analysis involves the reduction of a digital waveform to a four-character code by the use of shift registers and a logic equation. The four-character code is nearly unique for any waveform).

Software available for the system depends on the options specified when buying the board. It can vary from none, to CP/M 2.2 and CP/M PLUS with full documentation. The BIOS provided makes extensive use of the many utilities provided in the ROM. One of its nice touches is the provision of timeouts on peripherals such as the printer and disk drives. This was done so that the use of the front panel reset button may be kept to a minimum.

From the documentation, it appears Databank must use the extra 64K with a real time process while running CP/M in the other 64K as a background operation. To have the reset button used to free the processor from hangups while running CP/M, will have a devastating effect on any real time process — hence the need to eliminate the use of the reset button.

Apart from the usual CP/M programs supplied. Delphi is including two more.

The first is a program to format floppy disks. Unfortunately, it requires the operator to remember codes for the different options and get them in the right order on the command line. While this method is easier to program and takes up less code, there are good arguments for not having to remember codes and numbers — especially when the program is seldom used.

The second program reconfigures the system for different peripherals or disk densities. Such programs are great timesavers as the BIOS does not have to be reassembled every time the printer's baud rate is changed, for example.

As mentioned, documentation is written for a technical reader. The manuals are being updated, but are already very comprehensive and well laid out.

All the hardware is described in full detail, while the software manuals limit themselves to the user interface with the software. All the calls to the firmware have their descriptions and parameters well documented but a listing of the source for each function would have been appreciated.

As a development system, this system should too, do well. It will not be a big seller, as the number of possible users is more restrictive than were it aimed at the domestic market. However, against this gloom is the price — the assembled and tested board, with CP/M, sells for less than $1000 (excluding sales tax).

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In the previous two articles in this series, we reviewed Vision and Symphony as well as introducing the concept of application software integration and the productivity increases they are intended to produce. It was also noted that in some cases, there is more confusion created than productivity. This is due to the proliferation of features offered by the different products available. In this article, we look at the product called Framework and its approach to integration.

FRAMEWORK

Best of both worlds

By John J. Vargo

Framework, from Ashton Tate, the marketer of dBASE II and the new dBASE III, sets high standards for performance and ease of use. This new integrated product offers the best of both worlds with a tightly integrated suite of applications packages, yet still allowing the use of third party and existing software within the working environment.

The use of windows is a natural extension of Framework's outlining feature which provides an easy way to organise your thoughts and later access the thoughts you have had about your thoughts.

The product gets its name from the underlying principle of "frames" — there are "containing frames" (like a file drawer) which have "frames" (or files) within them, which may then have "sub-frames" (documents, spreadsheets etc.) within them. The "outline" which you create in the first place provides an easy, intuitive way to find your way around your files, and to organise your thoughts on the fly!

Closely-knit applications packages include word processing, spreadsheet, database, graphics, and communications. A built-in programming language — called "FRED" — is also included and you can directly access dBASE II and III data bases, filtered for particular records!

Framework is based on an outlining concept in which the user creates an outline of the documents he or she has in mind and the Framework program then automatically establishes the necessary "frames" to contain the expected segments of the documents, spreadsheets, databases etc. This very powerful concept is ideal for creative people, allowing great flexibility in recording ideas.

The working environment makes powerful yet comfortable use of windows allowing the most intuitive, and quickest use I have yet seen of this integrating feature. It is possible to select a particular file from either a disk menu or from a previously opened outline, and then open the file to full size or a smaller window size to suit your needs.

The package's ability to run third party and existing software without leaving the working environment is a real plus. I successfully loaded Lotus 1-2-3 from within Framework, and exited again without losing my place in the Framework operating environment. Very neat! With Lotus, there seemed to be no loss in performance as Lotus seemed to take over the system.

I also used the Word-Plus spell checker in a similar fashion. Unfortunately, it slowed to a crawl when under the management of Framework. When run on its own with a saved text file (another special feature of Framework which allows reformatting a "frame" into a normal text file), Word Plus ran at quite an acceptable speed. So when using the DOS "frame" feature check to see the performance is not unacceptably impaired.

Nine pull-down menus are used to access most of the special features.

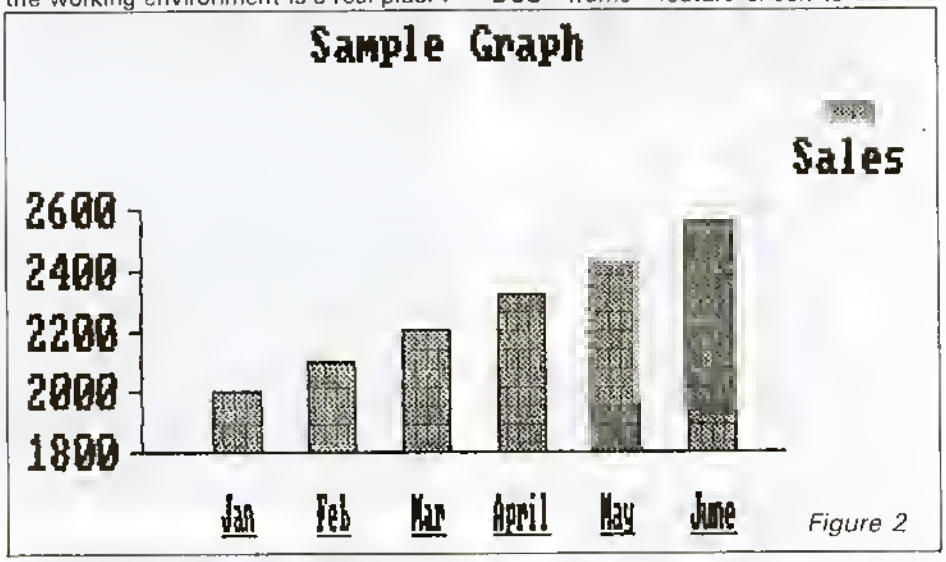

Figure 2

The sample graph in Figure 2 was generated from the associated spreadsheet in Figure 1. Simply by highlighting the entries on the sales lines (2000. . . 2553), selecting the bar graph from the GRAPHS menu and selecting DRAW NEW GRAPH from the same pull-down menu, the main title, X and Y axis titles and the legend were all automatically produced by Framework.

Figure 1

	Jan	Feb	Mar	April	May	June
Sales	2000	2100	2205	2315	2431	2553
Cost of Sales	1100	1155	1213	1273	1337	1404
Gross Margin	900	945	992	1042	1094	1149
Selling Expenses	440	462	485	509	535	562
Admin. Expenses	800	800	800	800	800	800
Total Expenses	1240	1262	1285	1309	1335	1362
Net income	-340	-317	-293	-267	-241	-213

These nine menus, together with the special function keys (with appropriate templates, of course), make Framework quick and easy to use. The pull-down menus — "a la Macintosh" — appear on the top line of the screen this way:

Disk Create Edit Locate Frames Words Numbers Graphs Print.

Access to these pull-down menus is via cursor pointing after striking the insert key, or by using the CTRL key with the initial letter of the menu. For example, the key sequence, CTRL W B, would produce the Word menu and turn the bold switch to on.

Window manipulation is performed easily using the special function keys to DRAG, SIZE, COPY and MOVE the window around on the screen as well as move and copy data from one window to another. Each of these processes happens very quickly, with little delay between command execution and completion.

One of the integrating characteristics of this program is that the special features of the operating environment are available to all applications. For example, all the word processing features, including bold, underlining and italic, may be used freely in the spreadsheet to stylise the document. The locate function may be used for numbers or text in the spreadsheet, word processor or database.

This makes the ease of use and functionality of the program outstanding. Although the use of the common features is not universal (for example it is not possible to do computations from within a "word frame"), the level of integration is still quite impressive.

The writers of this program have chosen to use high resolution graphics in black and white, and use colour only in the graphs when set to full size. This way be a disappointment to some as it was in the Lisa/Macintosh, but the effect of the high res graphics in black and white is still quite good, and it shows there are still some limits to the current technology.

The Framework integrated environment also has a built-in spooling feature to allow continued use of the program even when a document is printing. Like other packages with a similar feature, performance is affected depending on what else you are doing. Perhaps when the likes of the IBM-AT are more readily available, the additional power will mean true multi-tasking in micros without a substantial decrease in performance.

The hardware requirements

Framework has managed to include all these features in a tightly configured package which requires only 256K of memory and two floppy disk drives. The programs themselves are on four disks, including a tutorial disk and a utilities disk. In effect, only two working disks are required in normal operation. One of these is Prolock protected so that it cannot be copied (a backup is included with the package) in a useable form.

Even though only 256K of RAM is required to run the package, this does not leave a tremendous amount of working space for actual document or spreadsheet creation — enough for about 12 pages of text or a 500-cell worksheet. The size of the working space is strictly limited by the amount of memory — the more memory the more working space. At 512K RAM, there is room for about 73 pages of text or a spreadsheet of 3000 cells (or some combination of these together with other applications e.g. graphics, database and communications.

It seems the authors of the package (and other similar packages) are planning to take advantage of the dropping memory prices and generally larger memories becoming available with the newer 16 and 32-bit processor-based machines. No hard disk is required, nor does the package support special input devices like the mouse or light pen in its current configuration.

In addition, the package provides support for the 8087 math co-processor which for, some applications, could substantially increase the spreadsheet's computational performance. The package provides a great deal of facility for a relatively low hardware requirement.

Word processing

When starting in the word processing environment, it is necessary to create an empty "word frame" which then acts as the file for your document. This word processor has all of the usual functions allowing **bold**, underline, and *italics* (although subscript and superscript do not appear to be supported at present). These special features appear on screen just as they will appear on the printer, assuming your printer supports all the features. This is in contrast to displaying control characters to indicate what feature is in effect.

This may seem unimportant, but if you have ever forgotten one bold control character in WordStar and have seen the whole document come out bold, you will appreciate the onscreen display of special features — what you see is what you get!

Search and replacement of text can be done for one instance only or the document as a whole. Included in the search capability is the ability to use wild cards in the word or phrase for which you are searching. If you are not sure how you have mis-spelled a word, or the exact words used in a phrase, you may use two special characters (? and *) as a substitute for any single unknown character or group of characters. This feature is also available in the other applications. By the use of a "containing frame", a spreadsheet or graph may easily be included in an integrated document.

Formatting the document or segments of the document is easily accomplished using the WORDS menu which allows easy changes in margins, indentation, and justification etc. The use of boilerplate text is very useful in any word processor. Framework uses the "macro" function, assigning a series of keystrokes to one ALT-key sequence (holding the ALT key and A down at the same time equals ALT-A). You can create a library of your most often used words, phrases or paragraphs with each unique example assigned to one ALT-key. You need then type only the ALT-key pair and the associated character string appears.

Spreadsheet

The Framework spreadsheet has many nice features, most notably the availability of the bold, underline and italic features from the word processor, and the presence of a complete programming language called FRED. As would be expected, the spreadsheet includes all the usual capabilities for formula creation, special formatting for dollars and cents, percentage etc, and column width adjustment and so on. Framework uses the operating environments, MOVE and COPY special function keys, within the spreadsheet to achieve those features.

String handling functions are readily available using the LOCATE menu search functions, again common to the other application packages.

In the use of "macros" within the spreadsheet, there is wide flexibility with the FRED language to create quite sophisticated automated features. To use the automatic macro learning facility, you must step out of the spreadsheet environment and create a macro library. In some cases, this is a good organisational technique yielding a designed and controlled library of macros. In other cases, it may cramp the style of the more spontaneous spreadsheet user.

The spreadsheet makes use of a special function key (F2) for formula creation using cursor pointing. I found this a bit hard to get used to at first, since most other packages allow the creation of a formula with cursor pointing by using any number or operator as the first character of the formula.

Another unusual feature is the need to specify the size of the spreadsheet before you start. The package assumes you will be using a 14 x 14 matrix, and anything larger must be specified. However, it is easy enough to add rows

or columns as needed while working on a a spreadsheet. This is what I ended up doing, rather than trying to figure out my precise needs ahead of time. After a while I got used to these idiosyncrasies and found the application easy enough to use.

Framework uses an interesting feature for formula references. The option is available to reference every cell by a name automatically assigned based on the text in the column heading and the text in the first column of the row. For example, in a spreadsheet with the months, January to December, heading columns B, C . . . M and the account titles for sales, cost of sales, and gross margin in rows 1, 2, and 3, you could then use:

B2-B3=B4 (the normal cell referencing system)

or

January. Sales–January. Cost of sales for the formula to compute the gross margin. In both cases, cursor pointing could be used and the cell references would appear automatically. The choice of presentation is toggled by the use of a special character (the !). A very handy feature, it makes reading formulas much easier, without having to go through the process of actually naming the cells.

This product also makes extensive use of the capability to reference from one spreadsheet to other related spreadsheets within the same containing frame. This does not increase the potential size of the spreadsheets allowed, but does enhance the ability to organise the data in a more coherent manner.

Sorting of data is easily accomplished by the working environment's LOCATE menu which allows ascending or descending sorts on character strings and numbers in all applications. If you want to sort on more than one index (column) it is necessary to do them one at a time in the order you want.

Database processing

The database processing module in Framework feels like an extension of the spreadsheet, and is largely just that. This may have been intentional on the part of the authors since Framework will read directly from dBASE II and dBASE III files, and is expected to be used as an extension rather than a replacement of those packages. The database will exchange information readily with a spreadsheet and computed data can be linked from associated spreadsheets.

Searching the database uses the same simple but effective features of the operating environment described in the word processing section. By using the LOCATE menu, it is possible to search either individual fields or the entire database for particular data. It is also possible to replace the information searched for (e.g. all employees with payrate $5.20 now to be $5.70). In this basic form, the program does not give all the logical search criteria allowed with other full feature DBMSs but would be quite acceptable for many applications and requires little special training. With the use of the built-in FRED programming language, this can be largely overcome.

Creating mailing labels or including some information from a database into a form letter is possible using FRED. In this particular case, the Framework authors have already included a library of useful utilities on the utilities disk, including a mailing label program and a mailmerge program.

Graphics

I found the graphics program very easy to use and the menu selections self-explanatory. To create a graph you first select a range of cells from either a database or a spreadsheet. Having selected the appropriate cells with the EXTEND SELECT key (F6) you choose the required type from the GRAPHS menu. Then choose the "draw new graph" selection from the same menu and the graph is drawn for you.

Item identification is automatically selected from the database field names or spreadsheet column headings, although this can be overridden. You can then modify the graph by adding titles to the X or Y axis, change the scaling (which is automatically assigned) or cause the pie chart to be an exploded pie chart. Graph types allowed include bar, stacked bar, pie, line, X-Y, or marked points.

Since no colour is used, all sections use cross hatching for differentiation. There is also a special option allowing

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SOFTWARE REVIEW

additional graph overlays using a line graph or marked point graph to overlay existing graphs.

A surprise feature was the use of colon in the graphs when set to full size — undocumented plus.

Communications

Framework also includes a full feature telecommunications program which can be run either in conjunction with the Framework application packages (e.g. to capture data from an external source into a database), or separately in a standalone configuration. The communications package allows auto dial and auto answer.

The system comes preconfigured for the most usual requirements in US terms, but may require new macros to be written to automate some of the more tedious procedures for the New Zealand environment. The manual includes detailed instructions for configuring Dow-Jones access, including the capture of Dow-Jones data into a spreadsheet. Sample instructions are given for setting up and sending mail via Telemail electronic mail system.

Summary

Framework will undoubtedly be one of the serious contenders in the "integrated products" sweepstakes. It has an excellent general purpose word processor, good graphics, a very useful outlining feature, acceptable database and a good but slow spreadsheet. The package really shines in the area of window manipulation and general speed (which unfortunately does not extend to the spreadsheet). As with most packages, there are other features.

Framework is a very nice package and, in spite of its many features, is not complicated to learn. It allows the prospective user to use the more sophisticated features allowed by the built-in programming language as he or she wants.

Soaring Sanyo

The Sanyo MBC-550 is smashing computer production records in Japan for the Sanyo Electric Company.

Sanyo, a major manufacturer and exporter of electronic equipment and home appliances for many years, began exporting its computers just over three years ago. After exporting 28,000 of the 35,000 personal computers, it produced in 1983, Sanyo trebled its 1984 production to 100,000, and intends trebling that again to 300,000 units this year.

A recent survey (by Arthur Hoby & Associates) of micro-buying in New Zealand ranked Sanyo third in volume sales.

PROGRAMS

CAT

Life Saver

By Milo Davies

This program is for the Cat without emulator cartridge. The object of the game is to catch paratroopers falling from the sky, while avoiding heat-seeking missiles. Full instructions are included in the program. Milo's highest score is 243.

```
1  HOME : PRINT "          LIFE SAVER"
2  PRINT : PRINT "IN LIFE SAVER YOU HAVE TO CATCH THE "
3  PRINT "FALLING PARATROOPERS AND SAVE THEM FROM"
4  PRINT "GETTING EATEN BY SHARKS IN THE WATER."
5  PRINT : PRINT "YOU START WITH 3 MEN,AND WHEN THE 3"
6  PRINT "ARE USED UP IT IS GAME OVER."
7  PRINT : PRINT "SOMETIMES YOU WILL GET A HEAT SEEKING"
8  PRINT "MISSILE WHICH WILL FOLLOW YOU,KEEP AWAY"
9  PRINT "THEY HAVE A LONG RANGE."
10  PRINT : PRINT "LOOKOUT FOR ? THEY GIVE A MYSTERY BONUS."
11  PRINT : INPUT "PRESS RETURN TO CONTINUE";WE$
12  HOME : PRINT "OBJECT          IMAGE"
13  PRINT : PRINT "MISSILE          #"
14  PRINT "MYSTERY BONUS    ?"
15  PRINT "PARATROOPER";: HTAB 18: INVERSE : PRINT " ": NORMAL
16  PRINT "YOU              ___"
17  PRINT : PRINT "THE KEYS ARE 'O' AND 'P' FOR LEFT AND"
18  PRINT "RIGHT"
87  PRINT : INPUT "PRESS RETURN TO BEGIN";A$
88 HIGHT = 1
90 Y = 20
91  TEXT  NORMAL ,,BLUE
99 M = 3
100  IF S > 30 THEN HIGHT = 4: IF S > 60 THEN HIGHT = 7: IF S > 100 THEN HIGHT =
 10: IF S > 140 THEN HIGHT = 12: IF S > 180 THEN HIGHT = 15
101 P =  INT (S +  RND (11 * 301:TG = 0
102  LET TG =  INT ( RND (1) * 10)
103  HOME
104  IF TG < 2 THEN CD = 2
105  IF TG > 8 THEN CD = 1
106  IF TG = 2 OR TG = 3 OR TG = 4 OR TG = 5 OR TG = 6 OR TG = 7 OR TG = 8 THEN
CD = 3
107  FOR H = HIGHT TO 20
108  IF S = 100 OR S = 150 OR S = 200 OR S = 250 OR S = 300 THEN  GOTO 500
130  VTAB 20: HTAB Y: PRINT "___"
131  IF CD = 2 THEN  VTAB H: HTAB P: PRINT "?": GOTO 149
132  IF CD = 1 THEN  VTAB H: HTAB P: PRINT "#": GOTO 141
140  VTAB H: HTAB P: INVERSE : PRINT " "
141  NORMAL
142  IF CD <  > 1 THEN  GOTO 149
143  IF Y + 2 > P THEN P = P + 5
144  IF Y + 2 < P THEN P = P - 5
145  IF P > 39 THEN P = 1
146  IF P < 1 THEN P = 39
149 I$ = ""
150  IF  PEEK ( - 163841 > 127 THEN  GET I$
155  IF I$ = "" THEN 180
160  IF I$ = "O" THEN Y = Y - 4
161  IF I$ = "S" THEN  GOSUB 1000
170  IF I$ = "P" THEN Y = Y + 4
171  VTAB 20: PRINT "
180  IF Y > 39 THEN Y = 1
190  IF Y < 1 THEN Y = 36
191  VTAB 22: PRINT "SCORE=";S
192  VTAB 23: PRINT "MEN=";M
200  VTAB H: PRINT "
201  NEXT H
202  IF CD <  > 2 THEN  GOTO 212
211  IF P = Y OR P = Y + 1 OR P = Y + 2 OR P = Y + 3 THEN S = S +  INT ( RND (1
     1 * 20): SOUND 10,10,1,12: GOTO 100
212  IF CD <  > 1 THEN  GOTO 220
213  IF P = Y - 4 OR P = Y - 3 OR P = Y - 2 OR P = Y - 1 OR P = Y OR P = Y + 1 O
R P = Y + 2 OR P = Y + 3 OR P = Y + 4 OR P = Y + 5 OR P = Y + 6 OR P = Y + 7 THE
N  GOTO 222
215 S = S + 2: SOUND 10,10,1,12: GOTO 100
220  IF P = Y OR P = Y + 1 OR P = Y + 2 OR P = Y + 3 THEN S = S + 1: SOUND 10,1
     0,1,12: GOTO 100
222  SOUND 30,40,1,12
223 M = M - 1: IF M < 0 THEN  GOTO 250
230  VTAB 22: HTAB 15: PRINT "YOU HAVE LOST A MAN": HTAB 15: INPUT "PRESS RETUR
     N";EXTRA$
240  IF M >  = 0 THEN 260
250  HOME : VTAB 10: HTAB 15: FLASH : PRINT "GAME OVER": NORMAL
251  VTAB 12: HTAB 15: PRINT "SCORE=";S
252  VTAB 14: HTAB 15: PRINT "1) ANOTHER GAME": VTAB 15: HTAB 15: PRINT "2) QUI
     T";I$ = ""
253  VTAB 10: HTAB 20: GET I$: IF I$ = "1" THEN  RUN
254  IF I$ = "2" THEN  HOME : END
255 I$ = "": GOTO 253
260  GOTO 100
500  VTAB 22: HTAB 15: PRINT "YOU HAVE ANOTHER MAN!": VTAB 23: HTAB 15: INPUT
     PRESS RETURN TO CONTINUE";AAAA$:M = M + 1:S = S + 1: GOTO 101
1000 I$ = ""
1010  IF  PEEK ( - 16384) > 127 THEN  GET I$
1020  IF I$ = "S" THEN  RETURN
1030  GOTO 1000
```

More programs: page 38

Learning with Logo

By Ross Polson

A large number of people must now be using Logo and it's time we started sharing ideas.

A very user-friendly language, Logo's appeal stems from its graphics abilities and the closeness of its commands to everyday English:

```
TO SDUARE
FDRWARD 30 RIGHT 90
FORWARD 30 RIGHT 90
FDRWARD 30 RIGHT 90
FDRWARD 30 RIGHT 90
END
```

Logo was invented as a teaching language, aimed especially at school students. It helps their knowledge of computers, their mathematical and language skills, and their problem-solving techniques. Large concepts can be broken up into small pieces, so big problems become small problems. This makes Logo a very stimulating environment, as each person can learn at his or her own level.

Most people begin learning Logo through the famous turtle — a screen copy of a robot drawing device shaped like a turtle. Because the turtle behaves like a very obedient human, the new programmer can quickly draw complex and fascinating designs:

```
TD DESIGN :X
FDRWARD :X RIGHT 91
DESIGN :X+2
END
TO NDTHER.DESIGN
REPEAT 36 [REPEAT 5 [FORWARD 40
RIGHT 144]]
END
```

Yet there are many other facets of Logo just as worthy of investigation. Logo handles words and lists (strings), manipulates and calculates numbers, and controls peripherals like a fully-fledged language.

```
MAKE "MESSAGE [THIS IS A LIST IN
LDGD]
PRINT :MESSAGE
MAKE "X1
REPEAT 6 [(PRINT :X ITEM :X :MESSAGE)
MAKE "X :X+1]
```

Logo is probably best learned from a book or manual (see bibliography) but it can be instructive to experiment with your own ideas and let the error messages be a guide.

To start with the message, "I DON'T KNOW HOW TO UP" means you understand the command "UP" but Logo doesn't. It can be frustrating until you read "NOT ENOUGH INPUTS TO FORWARD". Now you realise you have hit on a command which Logo understands but you don't. It is a lot like an adventure game.

Here are some of the turtle "primitives":

FORWARD	BACK	LEFT
RIGHT	CLEAN	CLEARSCREEN
SHOWTURTLE	HIDETURTLE	SETHEADING
SETPOS	SETX	SETY
TOWARDS	PENUP	PENDOWN
PENERASE	DOT	XCOR
YCOR	SETSCRUNCH	HEADING
SETBG	SETPC	REPEAT
HOME	FENCE	WRAP
WINDOW		

Logo can provide a centre for many teaching activities. To start with, though, young children especially should "play turtle" — pretend they are robots and follow instructions. They can therefore "occupy the position of" the turtle and so "reconstruct a perspective point of view" — that of the turtle. (Piagets' idea.) Then it is time to go to the computer and see if they can create the list of commands to make the screen robot do the same.

Have you wanted to get a little sound into your Logo routines? PRINT CHAR 7 will beep the Apple (it is a CTRL G). And here is a little CLICK:

```
TO CLICK
MAKE "C EXAMINE 49200
MAKE "C -EXAMINE 49200
END
```

("Examine" is the equivalent to BASIC'S PEEK, and address 49200 is the Apple speaker.)

The beauty of it is that once your Logo turtle can click, it can buzz or rumble or send morse or . . .

```
TO BUZZ :M
REPEAT :M [CLICK]
END

TO A
ARCR 100 18
END

TO STDREX&Y
MAKE "X XCDR
MAKE "Y YCDR
END

TD RESETX&Y
SETX :X
SETY :Y
END

TO SDUND DESIGN
TD REPEAT 20 [A CLICK STDREX&Y
SETPOS [0 0] PU CLICK RESETX&Y PD
BUZZ 5]
END
```

And just for fun:

```
TD TELEPHONE
REPEAT 2 [BUZZ 20 WAIT 20]
WAIT 30
TELEPHONE
END
```

This brings us to recursion, a powerful idea in Logo. Notice in TELEPHONE that the final command in the procedure is itself — or more correctly another procedure identical to itself. So after the telephone BUZZes and WAITs, it calls a copy of itself, which calls a copy, which calls a copy. . .until you answer the phone with a CTRL G! (I wonder how the screen could show a "telephone" message when you "answer"?)

Recursion is worth a lot of study and experimentation. Some introductory ideas can be gained by looking at a mirror through a small hole in another mirror. Or pointing a video camera at the TV to which it is connected. Even a "feeding-back" amplifier or the Russian "Petrushka" dolls shows the recursive concept. These all involve ideas of infinity, a place impossible to demonstrate.

Where a computer is involved, of course, the impossible becomes possible. The turtle can be told to start a design which would take forever to complete. A square can be drawn thus:

```
TO SQUARE
FDRWARD 60 RIGHT 90
SDUARE
END
```

The problem is that the poor turtle doesn't know when to stop. The first DESIGN procedure above uses recursion but with the added dimension of growth. The variable, :X, is incremented by two each time the procedure is called. A suitable stopping place can be created by using IF:

```
TD DESIGN :X
FDRWARD :X RIGHT 91
IF :X<250 [STDP]
DESIGN :X+2
END
```

Try DESIGN with various numbers. Try altering the amount of turn or the stopping condition.

There must be lots of ideas being tried out, on many different machines. So send them into *Bits & Bytes* and share them. If you have any questions about Logo, I will try to find the answers.

Has anyone found the way of sending the Logo pictures to a Super-5, CP80 printer? The Super-5 is supposed to behave like an Epson, but I haven't found the formula yet.

Here are some books and magazines you may find useful:

- *Mindstorms — Children, Computers and Powerful Ideas*, by Seymour Papert, published by The Harvester Press.
- *Learning Logo on the Apple II*, by McDougal, Adams and Adams, published by Prentice-Hall.
- *Logo in Electronic Learning*, March 1983, vol. 2, no. 6, published by Scholastic Inc.
- *Exploring New Horizons with Logo in Electronic Learning*, April 1983, vol. 2, no. 7, published by Scholastic Inc.
- *The Computing Teacher* — special Logo issue — December/January 1983-84, vol. 11, no. 5. The Journal of the International Council for Computers in Education.

Logo is available for Apple, BBC, Poly and Commodore 64 computers.

Ross Polson is very interested in learning from others interested in Logo application. You can write to him at:
13 Gibbs Drive,
Woodend.

Sanyo portable

The price for the standard model of the Sanyo portable, reviewed in the February issue of *Bits & Bytes*, has been increased to $5295 from $4995.

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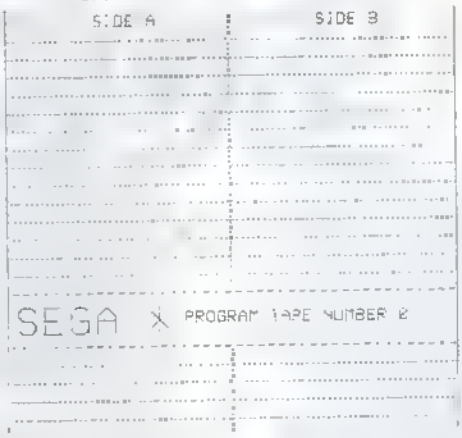
SEGA

Cassette Liners

By Bryn Holland

This utility program prints liners to use in cassette cases, complete with a tape number and spaces to write the contents of side A and B of the cassette.

```
10 CLS:REM:CASSETTE FILE
20 LPRINT CHR$(18):LPRINT"L0"
30 LPRINT"D470,0":LPRINT"M95,0"
40 LPRINT"L6":LPRINT"D95,-505"
50 LPRINT"M155,0"
60 LPRINT"L6":LPRINT"D155,-505"
70 LPRINT"M0,-505"
80 LPRINT"L0":LPRINT"D470,-505"
90 LPRINT"M10S,-10":LPRINT"S4"
100 LPRINT"G1":LPRINT"PSEGA *"
110 LPRINT"M120,-200":LPRINT"S1"
120 INPUT"INSERT TAPE NUMBER ";N$
130 LPRINT"PPROGRAM TAPE NUMBER ";N$
140 LPRINT"M450,-100":LPRINT"S1":LPRIN
T"G1"
150 LPRINT"PSIDE A":LPRINT"M450,-350"
160 LPRINT"PSIDE B":LPRINT"M435,0":LPR
INT"L3"
170 FOR I=1 TO 20
180 READ X1,Y1
190 LPRINT "D";X1;",";Y1
200 READ X2,Y2
210 LPRINT "M";X2;",";Y2
220 NEXT I
300 LPRINT"A":GOTO 2000
990 DATA495, 505,415,0
1000 DATA415,-505,395,0
1010 DATA395,-505,375,0
1020 DATA375,-505,355,0
1030 DATA355,-505,335,0
1040 DATA335,-505,315,0
1050 DATA315,-505,295,0
1060 DATA295,-505,275,0
1070 DATA275,-505,255,0
1080 DATA255,-505,235,0
1090 DATA235,-505,215,0
1100 DATA215,-505,195,0
1110 DATA195,-505,175,0
1120 DATA175,-505,75,0
1130 DATA75,-505,55,0
1140 DATA55,-505,35,0
1150 DATA35,-505,15,0
1160 DATA15,-505,470,-250
1170 DATA155,-250,95,-250
1180 DATA0,-250,0,0
2000 END
```



SPECTRUM

Snake

by Miguel Scotter

In this game, you are a snake — and must eat power packs and avoid trees, while sliding down a mountain. Full instructions are given in the program.

```
  1 OVER 0: FLASH 0: PAPER 7: I
NK 1: BORDER 1: RESTORE : GO SUB
 1000: OVER 0: BORDER 1: CLS : P
RINT AT 10,10; INK 1; FLASH 1;"
S N A K E "
  2 PRINT AT 13,10; INK 1;"By M
IGUEL SCOTTER
--------------": PRINT TAB 2; IN
K 1;"Dodge the trees in the fore
st   while  keeping your energy
up   by eating energy packs !";C
HR$ 145;".You   change colour wh
en your energy   is low.It gets
harder as you    go. 1=left 2=ri
ght": PRINT TAB 8; INK 2;"PRESS
A KEY": PAUSE 0
  3 FOR a=0 TO 10: PAUSE 10: BE
EP .01,-20: PRINT AT a,14; INK 0
;"!": NEXT a
  4 CLS : PRINT AT 10,10; INK 2
; FLASH 1;" B O O M ! ": FOR A=5
0 TO 39 STEP -1: BEEP .1,A: NEXT
 A: BEEP 1,-10
  5 PAUSE 100
 19 LET t$=CHR$ 144+CHR$ 144: L
ET p=10: LET e=100: LET z=0: LET
 a$=CHR$ 124: CLS : INK 0: LET a
=15
 20 PRINT AT 10,a;a$: LET z=z+1
 30 LET r=INT (RND*6): LET v=33
-LEN (t$): IF r<>2 THEN  POKE 23
692,255: PRINT AT 21,0: PRINT TA
B INT (RND*v); INK 4;t$
 35 IF r=2 THEN  POKE 23692,255
: PRINT AT 21,0: PRINT TAB INT (
RND*v); INK 2;CHR$ 145
 40 IF ATTR (10,a)=60 THEN  GO
TO 100
 41 IF ATTR (10,a)=58 THEN  LET
 e=100: BEEP .01,20: BEEP .05,21
: GO TO 76
 45 LET e=e-1: LET a$=CHR$ 124:
 IF e=0 THEN  GO TO 90: IF e=10
THEN  INK 5
 50 IF e=25 THEN  INK 5
 51 IF e>25 THEN  INK 0
 55 BEEP .008,-20
 60 IF INKEY$="1" THEN  LET a$=
"/": IF a>0 THEN  LET a=a-1
 65 IF INKEY$="2" THEN  LET a$=
"\": IF a<31 THEN  LET a=a+1
 70 IF ATTR (10,a)=60 THEN  GO
TO 100
 72 IF ATTR (10,a)=58 THEN  LET
 e=100: BEEP .01,20: BEEP .05,21
 76 IF z=200 OR z=400 OR z=600
OR z=1000 OR z=2000 THEN  LET t$
=t$+CHR$ 144
 77 LET mig=0
 80 GO TO 20
 100 PRINT AT 10,a;z
 105 BEEP 1,-50: PAUSE 0: PAUSE
0
 110 GO TO 10
1000 FOR a=0 TO 7: READ b: POKE
USR "a"+a,b: NEXT a
1010 FOR a=0 TO 7: READ b: POKE
USR "b"+a,b: NEXT a
2000 DATA BIN 00011000,BIN 00011
100,BIN 00111000,BIN 00011110,BI
N 01111000,BIN 00011111,BIN 1111
1000,BIN 00011000
2010 DATA 0,BIN 00011000,BIN 001
11100,BIN 00111100,BIN 00111100,
BIN 00011000,BIN 00011000,0
2020 RETURN
```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Standard horizontal density of 480 dots, double density of 960 dots per line.

Continuous Underline
You can underline with just one pass of the print head instead of two.

Paper Feed
a. Adjustable snap-on tractor feed (10cm – 25.5cm) (optional).
b. Friction feed (10cm – 25.5cm).
c. Pin platen (24 cm).
You can use cut sheets, fan fold or pin feed paper.

Character Set
Full 96-character ASCII with true lower case descenders. 96 italic characters. 32 block graphic characters.

Printing Mode
a. Standard. b. Double Strike.
c. Emphasised. d. Double Emphasized.
e. Italics. f. Superscripts and Subscripts. g. Expanded.
h. Compressed. i. Compressed/expanded.

Tab
Horizontal tab to 28 positions per line.

Buffer Size 1 line standard.
a. in case of pica-80 characters.
b. in case of compressed — 132.
c. in case of expanded — 40.
d. Bit graphics image mode — 480.

Interface
Centronics 8 bit parallel (standard).

Serial Interface (Option)
300-900 baud. Easy access to dip switches.

Ink Ribbon
Reinking compact black ribbon cassette. Easily replacable and low cost. Ribbon life expectancy: 1,000,000 characters.

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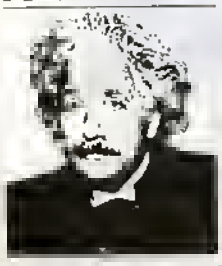

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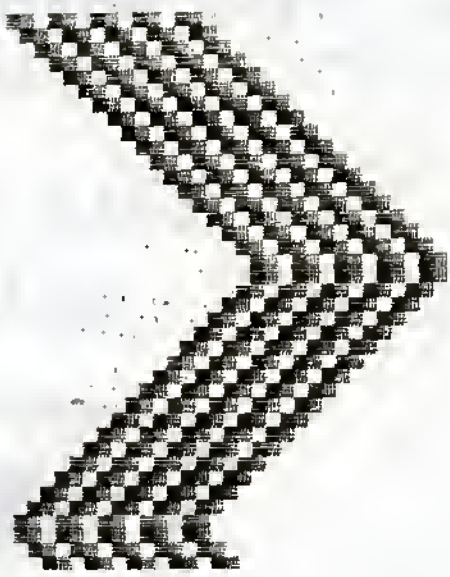
ZX81

Pattern Maker

By Andrew Joll

This 1K program will print a pattern which scrolls up the screen. You input a random number between 1 and 10 to determine the width of the pattern. The characters used in the pattern can be altered by changing line 10. To SAVE the program, enter GOTO 120.

```
PATTERN PROGRAM FOR THE 1K ZX81.
BY ANDREW JOLL.
   1 LET A$=""
   5 INPUT A
   6 IF A<1 OR A>10 THEN GOTO 1
  10 LET B$="■■"
  11 FAST
  12 FOR I=1 TO A
  15 LET A$=A$+B$
  16 NEXT I
  19 SLOW
  20 LET AP=(32-LEN (A$))
  30 CLS
  40 FOR T=0 TO AP
  50 SCROLL
  60 PRINT TAB I;A$
  70 NEXT I
  80 FOR I=AP TO 0 STEP -1
  85 SCROLL
  90 PRINT TAB I;A$
 100 NEXT I
 110 GOTO 40
 120 SAVE "PATTER■"
 130 RUN
1000 REM (C)ARJ:1984
```



VIC 20

Signwriter

By Alastair Brown

This program will print a message entered by the user in large letters. Enter a message, and the computer will count from 0 to 7 as it converts it, and then print it on the screen in 8 by 4 characters. To print your message on a printer, press any key.

If you have less than 8K memory, change the 4096 in line 20 to 7680. If you do not have a printer, change line 70 to 70 GOSUB 50 and omit lines 80-110.

```
10 PRINT"■"CHR$(14)"■■■ ";:INPU
TR$:R$=LEFT$(A$+" ",31)
20 FORT=0TO7:FORK=1TOLEN(R$):PR
INT"■"MID$(R$,K,1)T:X=PEEK(3481
6+PEEK(4096)*8+T)
30 FORMM=1TO4:A$(T)=A$(T)+MID$(
"■ ■■■ ",(XAND192)/32+1,2):X=
X*4AND255:NEXTMM,K,T:P=1
40 PRINT"■■■";:FORT=1TO88:PRINT
" ";:NEXT
50 PRINT"■■■■"CHR$(20)"■■■■■"CH
R$(20)"■■■";:FORT=0TO7:PRINT"■■
"MID$(A$(T),P,2);:NEXT
60 P=P+2:IFP>LEN(A$(0))THENP=1
70 IFPEEK(197)=64THEN50
80 OPEN1,4:FORT=0TO7
90 PRINT#1,LEFT$(A$(T),152)CHR$
(8)CHR$(13)CHR$(15);:NEXT:PRINT
#1:IFLEN(A$(0))<153THEN110
100 FORT=0TO7:PRINT#1,MID$(A$(T
),153)CHR$(8)CHR$(13)CHR$(15);:
NEXT
110 PRINT#1:CLOSE1:GOTO50
```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CLAUDE 14437

ZX81

Guess the Number

By Jeremy Coulter

In this amusing 16K program, you must try to guess a number chosen by the computer, aided only by its comments. After completing several stages, you are invited to enter your name in the high-score table.

```
   4 LET N$="??????????"
   5 CLS
  10 PRINT "CHOOSE A NUMBER BETW
EEN 5 AND 15"
  20 INPUT A
  30 LET N=INT (RND*5)+10
  40 IF A=N THEN GOTO 150
  50 IF A<>N THEN GOTO 100
  70 INPUT A$
  80 IF A$="A" THEN GOTO 5
  90 IF A$<>"A" THEN GOTO 70
 100 CLS
 110 PRINT "HA HA HA,YOUR WRONG"
 120 PRINT "THE ANSWER WAS ";N
 130 PAUSE 50
 140 GOTO 5
 150 CLS
 160 PRINT "VERY GOOD,YOUR ANSWE
R OF ";N;" IS VERY CORRECT-"
 170 PRINT "IF YOU WOULD LIKE TO
 PLAY AGAIN AT A HARDER LEVEL PR
ESS 0."
 180 INPUT A$
 190 IF A$="0" THEN GOTO 210
 200 IF A$<>"0" THEN GOTO 180
 210 CLS
 220 PRINT "CHOOSE A NUMBER BETW
EEN 15 AND 30"
 230 INPUT A
 240 LET N=INT (RND*15)+30
 250 IF A=N THEN GOTO 270
 260 IF A<>N THEN GOTO 310
 270 CLS
 275 PRINT "WELL DONE.IF YOU WOU
LD LIKE ANOTHER GAME AT ANOTHERE
 LEVEL THEN PRESS 0."
 280 INPUT A$
 290 IF A$="0" THEN GOTO 380
 300 IF A$<>"0" THEN GOTO 310
 310 CLS
 320 PRINT "NO IM SORRY"
 330 PRINT "YOUR ANWER WAS WRONG
 340 PRINT "PRESS ANY KEY"
 350 PRINT "TO CONINUE"
 360 INPUT A$
 370 IF A$="" THEN GOTO 5
 380 IF A$<>"" THEN GOTO 360
 390 CLS
 400 PRINT "CHOOSE A NUMBER BETW
EEN 30 AND 60"
 410 INPUT A
 420 LET C=INT (RND*30)+60
 430 IF A=C THEN GOTO 450
 440 IF A<>C THEN GOTO 310
 450 PRINT "VERY GOOD.IF YOU WOU
LD LIKE TO"
 460 PRINT "PLAY AT ANOTHER LEVE
L,PRESS"
 470 PRINT "0"
 480 INPUT A$
 490 IF A$="0" THEN GOTO 510
 500 IF R$<>"0" THEN GOTO 310
 510 CLS
 520 FOR X=1 TO 10
 530 PRINT AT 0,0;"[illegible]
ARE ARE"
 540 PRINT AT 0,0;"THIS IS THE H
ARD ONE"
 550 PRINT AT 5,5;"FELLA"
 560 PRINT AT 5,5;"[illegible]"
 570 PRINT AT 10,0;"THIS TIME CH
OOSE A NUMBER       BETWEEN ""10
 AND 100"""
 580 PRINT AT 10,0;"[illegible]
[illegible]
NEW 100."
 590 NEXT X
 600 INPUT B
 610 LET D=INT (RND*10)+100
 620 IF B=D THEN GOTO 640
 630 IF B<>D THEN GOTO 310
 640 CLS
 650 FOR Z=0 TO 21
 660 PRINT AT Z,0;"C"
 670 PRINT AT Z,1;"O"
 680 PRINT AT Z,2;"N"
 690 PRINT AT Z,3;"G"
 700 PRINT AT Z,4;"R"
 710 PRINT AT Z,5;"A"
 720 PRINT AT Z,6;"D"
 730 PRINT AT Z,7;"U"
 740 PRINT AT Z,8;"L"
 750 PRINT AT Z,9;"A"
 760 PRINT AT Z,10;"T"
 770 PRINT AT Z,11;"I"
 780 PRINT AT Z,12;"O"
 790 PRINT AT Z,13;"N"
 800 PRINT AT Z,14;"S"
 810 NEXT Z
 820 CLS
 830 PRINT "YOU HAVE DONE IT"
 840 PRINT "ENTER YOUR NAME FOR
 THE CHART"
 850 INPUT N$
 860 PRINT "WOULD YOU LIKE TO SE
E THE CHART"
 870 INPUT R$
 880 IF R$="Y" THEN GOTO 900
 890 IF R$<>"Y" THEN STOP
 900 CLS
 910 PRINT "THE HIGH SCORE BELON
GS TO,,,,,,,,"
 920 PRINT
 930 PRINT "....";N$
 940 PRINT
 950 PRINT "HOW ABOUT ANOTHER GA
ME"
 960 INPUT R$
 970 IF R$="Y" THEN GOTO 5
 980 IF R$<>"Y" THEN GOTO 1000
 990 STOP
1000 SAVE "NUMBER"
1010 RUN
```

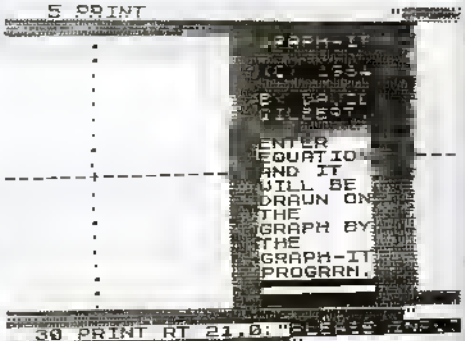
ZX81

Graph-it

by David Gilbert

This program, for the 16K ZX81, will graph a function which you give. The x and y axes are drawn from -9 to 9. You must enter the equation in a form which the computer will understand. Take care not to miss out multiplication signs, and avoid dividing by x, since this would cause the computer to divide by zero when x=0.

As an example, the equation
$y = 2x + x^3$
would be entered as
2*X+X*X*X.



```
  5 PRINT                    "
                  GRAPH-IT
                  (C) 1984
                  BY DAVID
                  GILBERT.
                  ENTER
                  EQUATION
                  AND IT
                  WILL BE
                  DRAWN ON
                  THE
                  GRAPH BY
                  THE
                  GRAPH-IT
                  PROGRAM.
 30 PRINT AT 21,0;"PLEASE
EQUATION."
 35 INPUT R$
 36 IF R$="" THEN GOTO 35
 37 PRINT AT 21,0;"
                  ";AT 21,0;"E
QUATION=";A$
 40 FOR X=-9 TO 9
 50 LET YY=10-(VAL R$)
 55 LET XX=X+10
 60 IF (YY<1 OR YY>19) THEN GOT
O 70
 65 PRINT AT YY,XX;"X"
 70 NEXT X
 80 IF INKEY$="" THEN GOTO 80
 90 CLS
100 RUN
```

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HAND-HELD

Artillery game

Mark Willmer, a civil engineering student at Wellington Polytechnic, designed this game around the motion of a projectile travelling on a parabolic curve. Line 10 must be printed on to the calculator. It was designed for the Casio 702P.

The aim of the game is to hit your opponent (enemy) before he reaches the base of the hill upon which you are situated. You are given the distance from the base of the hill to where the enemy is, the height above ground level that you are, and the angle (which is under 30 deg) that the gun is raised to. You must input the initial velocity of the missile to hit your target.

The enemy moves towards you the same amount as the mission number every time you miss him. That is the enemy moves two units every miss on mission two.

```
10. SAC : STAT R : VAC : R = SX
20. PRT "HIGH SCORE IS"; R
25. Z=1 : J=1 : K=1 : S=0
28. WAIT 40
30. M=INT (RAN # x 100)
40. H=INT (RAN # x 100)
50. A=INT (RAN # x 100)
53. IF A≥30 THEN 50
55. PRT "MISSION"; Z
60. PRT "ENEMY IS"; M; "M AWAY"
70. PRT "HEIGHT IS"; H; "M"
80. PRT "ANGLE OF GUN IS"; A; "D"
90. WAIT 5: T=1 : M=M-J
95. IF M≤0 THEN 450
100. INP "INITIAL VELOCITY", V
110. X = (V x Cos A)T: Y=(V x SIN A) T-4.9 x T^2 + H
120. PRT ###.#; x; CSR 8; ###; M; "TARGET"
140. IF Y≤0 THEN 170
150. T=T+1
160. GOTO 110
170. IF ABS (X-M)≤ 1 THEN 400
180. PRT "MISSED" : K=K+1 : GOTO 90
400. PRT "HIT IN"; K; "GOES"
410. J=J+1 : Z=Z+1 : Q=Z/X : S=S+Q : GOTO 28
450. PRT "YOU DIE - MISSION"; Z
455. PRT "SCORE IS"; S; "POINTS"
460. IF Z>R THEN 480
470. END
480. Z=R
```


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SHARP MZ700

Pie Graphs

By W.J.S. Barnes

This program uses the MZ700 printer/plotter to draw pie graphs of figures input by the user. It draws graphs of different sizes, labels each segment with its percentage, and prints a key to the graph.

```
10 REM PIE GRAPH
20 CLR:PRINT"■"
30 PRINTTAB(1)"P I E  G R A P H":PRINT
40 INPUT"TITLE OF CHART ";N$
50 PRINT:INPUT"DO YOU NEED TO CALCULATE
THE RADIUS?     Y/N   ";A$
60 IF A$="N" GOTO130
70 PRINT"CALCULATE RADIUS OF PIE"
80 INPUT"VARIABLE ";AA
90 R=(SQR(AA/π)):IFR>240PRINT:PRINT"TOO
LARGE, DIVIDE VARIABLE BY 10":MUSIC"R9"
100 IFR<24PRINT:PRINT"TOO SMALL, MULTIPL
Y VARIABLE BY 10":MUSIC"R9":IFR<24PRINT"
■":GOTO70
110 IFR>240PRINT"■":GOTO70
120 PRINT:PRINT"RADIUS IS "R:GOTO160
130 PRINT:INPUT"OK THEN ENTER RADIUS :";
R
140 IF R>240 THENPRINT"TOO LARGE":MUSIC
"R9":GOTO138
150 IFR<24THENPRINT"TOO SMALL" MUSIC"R9"
:GOTO130
160 PRINT:INPUT "NUMBER OF SEGMENTS ";NS
170 DIM P(30),PC(30),X(NS),Y(NS)
180 DIMKE$(NS):PRINT
190 MODEGR:PCOLOR1:MOVE240,-R-10:HSET
200 CIRCLE0,0,R,0,400,1
210 RT=0
220 FORI=1TONS
230 INPUT"% OF SEGMENT ";P(I)

240 CIRCLE0,0,R,RT,RT+P(I)*3.6  ,0
250 Z=P(I)*1.8:XZ=P(I)
260 RT=RT+P(I)*3.6 :X$=""
270 X(I)=(COS((RT-Z)*PAI(1)/180)*R*.7)
280 Y(I)=(SIN((RT-Z)*PAI(1)/180)*R*.7)
290 X$=STR$(XZ)+"%"
300 IFR>125THENP=1:IFR=<125THENP=0
310 MOVEX(I),Y(I):GPRINTP,0),X$
320 PRINTTAB(19)"■RUNNING TOTAL ";RT/3.6
330 NEXT I
340 C=(LEN(N$)*6)
350 MOVE-C,-(R+25):GPRINT(1,0),N$
360 MOVE-240,-(R+60):HSET
370 HSET:PRINT:INPUT"DO YOU NEED A KEY?
Y/N ";K$
380 IFK$="N"THEN MODE TS:SKIP5:END
390 FORI=1TONS
400 PRINTI:INPUT"■■■■";KE$(I)
410 NEXTI
420 FORJ=1TONS
430 MOVE5,-(24*J) :J$=STR$(J)
440 GPRINT(1,0),J$+"  "+KE$(J)
450 NEXTJ
460 MODETN:SKIP5:END
```

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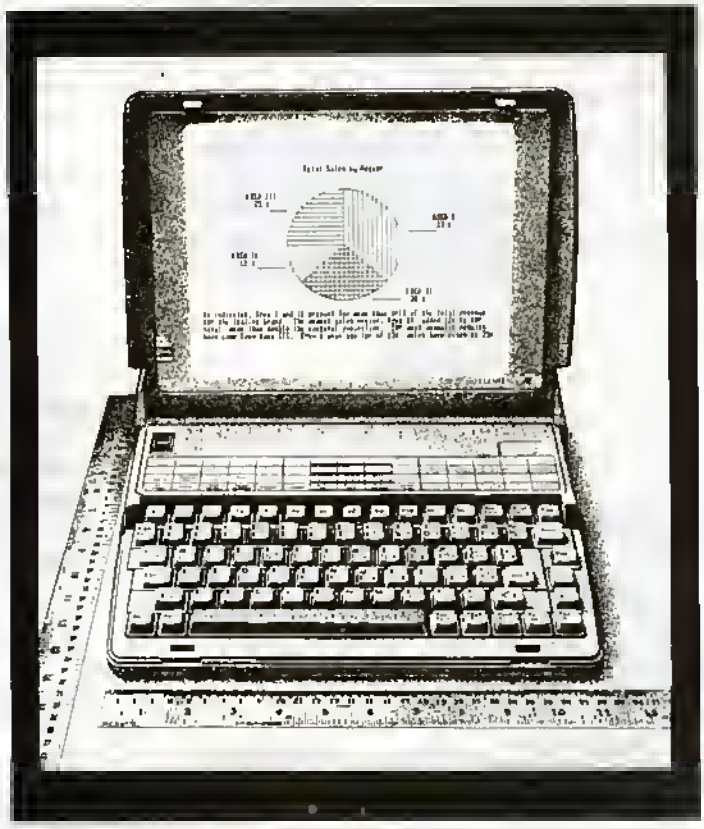

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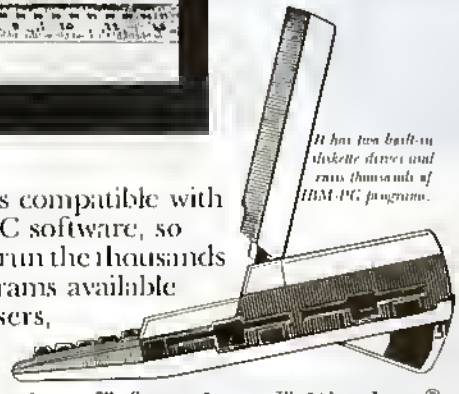

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APPLE

Biorhythms

By Joseph Albahari

This program will plot your biorhythm charts. Leave out the ONERR GOSUB statement of line 30 until you have removed any typing errors from the program, and then RUN. Enter your birth date and the present date, with the year as two digits such as '85'. Your physical, emotional, and intellectual cycles will then be drawn. The high or low extremes of the cycles signify good health, but if they are crossing the centre of the graph you ought to consider staying in bed for the day!

```
10  REM  BIORHYTHM
15  REM  BY JOSEPH ALBAHARI
20  REM
30  ONERR  GOTO 8000
40 CIR = 360
60 RAD = 57.29578
100  REM
102  DIM DM(12)
105  GOSUB 5000: REM  DAYS IN MON
     TH
110  TEXT : HOME
115  INVERSE : PRINT "--------BIOR
     HYTHM--------": NORMAL : PRINT
     : PRINT
117  PRINT : PRINT "Enter dates a
     s follows:"
118  PRINT : PRINT "Date, then mo
     nth, then last 2 digits"
119  PRINT "of year, all seperate
     d by commas": PRINT : PRINT
     : PRINT
120  PRINT "DATE OF BIRTH? ";BD",
     "BM","BY;
125  NTAB 16: INPUT "";BD,BM,BY
130  PRINT "PRESENT DATE? ";PD","
     PM","PY;
135  NTAB 15: INPUT "";PD,PM,PY
140 Y = PY - BY
150 M = PM - BM
160 D = PD - BD
170  IF D < 0 THEN M = M - 1
180  IF M < 0 THEN Y = Y - 1:M =
     M + 12
190  IF D < 0 THEN D = D + DM(M)
195  IF M = 0 THEN 250
200  FOR MO = BM TO (BM + M - 1)
210 ND = MO
220  IF ND > 12 THEN ND = ND - 12

230 D = D + DM(ND)
240  NEXT MO
250 D = D + 365 * Y + 1
255 ST = BY + 1:FI = PY - 1
260  IF BM < 3 THEN ST = ST - 1
270  IF PM > 2 THEN FI = FI + 1
280  FOR LEAP = ST TO FI
290  IF (LEAP / 4) =  INT (LEAP /
     4) THEN D = D + 1
300  NEXT LEAP
340  TEXT : HOME
345  FOR DOT = 1 TO 24: PRINT ".
      .  .  .  .  .  .  .  .  .
     .  .  .  .";: NEXT DOT
350  FOR X = 1 TO 40: VTAB 10: PRINT
     "_";: NEXT X
360  FOR Y = 1 TO 23: VTAB Y: NTAB
     1: PRINT "|";: NEXT
370  REM  PHYSICAL CYCLE
380 CN = 23:CY$ = "p": GOSUB 1000

390 CN = 28:CY$ = "e": GOSUB 1000

400 CN = 33:CY$ = "i": GOSUB 1000

480 LM = PM
500  FOR PR = 1 TO 39
510 TH =  INT (PD / 10)
520 BH = PD - TH * 10
530  NTAB PR: VTAB 22: PRINT TH;
540  NTAB PR: VTAB 23: PRINT BH;
545  NTAB PR: VTAB 24: GOSUB 2000
     : REM  PRINT MONTH
550 PD = PD + 1
555  IF PD = 29 AND PM = 2 AND PY
      / 4 =  INT (PY / 4) THEN 57
     0
560  IF PD > DM(PM) THEN PD = 1:P
     M = PM + 1:LM = LM + 1: IF P
     M = 13 THEN PM = 1:PY = PY +
     1
570  NEXT PR
580  GET A$
600  GOTO 110
1000  FOR LOOP = 0 TO 39
1005 PC = D -  INT (D / CN) * CN +
     LOOP
1010 Y =  INT ( SIN (PC * (CIR /
     CN) / RAD) *  - 10 + 11)
1020  NTAB LOOP + 1: VTAB Y: PRINT
     CY$
1030  NEXT LOOP
1040  RETURN
2000  REM  PRINT MONTH
2010 ML$ = "JFMAMJJASONDN"
```


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```
2020  INVERSE
2030 LM$ =  MID$ (ML$,LM,1)
2040  PRINT LM$;: NORMAL
2050  RETURN
5000  REM  DAYS IN MONTH
5005  RESTORE
5010  DATA  31,28,31,30,31,30,31
     ,31,30,31,30,31
5020  FOR DI = 1 TO 12
5025  READ DA
5030 DM(DI) = DA
5040  NEXT DI
5050  RETURN
8000  TEXT : HOME : PRINT  CHR$ (
     7); CHR$ (7)
8100  FLASH : PRINT "SYSTEM ERROR
     ": NORMAL
8110  VTAB 10: PRINT "Incorrect d
     ate entry?";: GET A$: RUN
```

ZX81

Side Scroller

By Antony Luton

Here is a short machine code routine for the 16K ZX81 which will scroll the screen one square left each time it is called with LET X=USR 16514. The number of lines scrolled can be altered by POKE 16515,n where n is the number of lines. POKE 16526 with the character to be scrolled onto the screen. For example, POKE 16526,128 to fill the screen with black squares.

To use the routine, type in the first part of the listing, lines 1 to 50, and RUN it. Delete lines 5 to 50 and SAVE line 1 which now contains the machine code. Type in the rest of the listing, lines 5 to 130, to obtain a demonstration of the routine. Use the up and down cursor keys to avoid the stars moving across the screen.

```
   1 REM XXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXX
   5 LET P=16514
  10 LET A$=" 62 24 42 12 64 64
33 35 35 19  1 31  0237176 43 54
  0 35 19 61 32240201"
  20 FOR A=1 TO LEN A$ STEP 3
  30 POKE P,VAL A$(A TO A+2)
  40 LET P=P+1
  50 NEXT A
   5 GOTO 100
  10 PRINT AT INT (RND*23+1),31;
"+";AT  H,0;">";
  15 IF PEEK (PEEK 16398+256*PEE
K 16399)=23 THEN GOTO 50
  20 LET S=S+1
  25 LET H=H+(INKEY$="5")-(INKEY
$="7")
  30 LET H=(H AND H>0)-(H=23)
  35 LET X=USR 16514
  40 GOTO 10
  50 PRINT "SCORE = ";S
  60 PAUSE 100
  70 CLS
 100 POKE 16418,0
 110 LET S=0
 120 LET H=11
 130 GOTO 10
```


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PROGRAMS

COMMODORE 64

Star Load

by Ken Hoffman & Bruce McNamara

Star Load is a high-speed loader program to replace the Commodore 64's slow tape loader. It will load and save BASIC and machine code programs at about 60% of the speed of a Commodore disk drive.

First make these two POKEs:

POKE 44,40
POKE 10240,0
NEW

Then type in the Create Program listed, which contains the machine code in data statements. Take care to enter it exactly as listed. Run it, and when the machine code has been put into place the program will save it on tape when you press any key. Turn the computer off and on, and you can load Star Load ready for use.

To activate Star Load, run it. Then you can use *S to save programs at high speed, and *L to load programs previously saved with Star Load. Star Load resides in memory addresses 52490 to 53248. If another program loads or POKEs into this area, you may have to deactivate Star Load using *K. To reactivate it, use SYS 52490. For advanced programmers, *X will save a block that has just been loaded using Star Load.

To make fast copies of your programs, load them normally, and save them with Star Load. Programs saved with Star Load are more susceptible to tape loading errors, so clean your tape recorder's heads if you have problems. Star Load puts a long delay on tape before saving data. You can reduce this with POKE 53024,254 before saving. After saving, reset this with POKE 53024,252.

If you have any queries about Star Load, Ken and Bruce can be contacted at:
S.C.U.G. Star Load
P.O. Box 1514
Invercargill.

If it's micro news in Auckland — phone Gaie Ellis 549-028

```
0 REM>>STAR-LOAD V3.9 0 CREATE PROGRAM<<
10 REM**** YOU MUST!!! DO THE FOLLOWING  POKES BEFORE TYPING THIS PROGRAM IN****
12 REM****POKE44,40:POKE10240,0:NEW ****
14 REM
20 IFPEEK(44)=0THENPRINT"■■■■POKE MEMORY POINTERS AND RELOAD":END
30 PRINT"■■■■■■■■NOW POKING DATA INTO MEMORY
40 FORT=2049 TO 3000:READA:POKET,A:X=X+A:NEXT
50 IFX<>109396THENPRINT"■■■■DATA ERROR CHECK ALL DATA STATEMENTS":END
55 PRINT"■■SAVE"CHR$(34)"STAR-LOAD V3.9 0"CHR$(34)",1■";
60 POKE 44,0:POKE45,179:POKE46,11:CLR:END
100 DATA41,0,10,0,158,40,50,50,48,52,41,20,20,20,20,20
110 DATA20,20,20,20,20,20,20,32,32,83,84,65,82,45,76,79
120 DATA65,68,32,86,51,46,57,0,154,8,0,0,20,20,13,32
130 DATA32,66,89,32,32,75,69,78,32,72,79,70,70,77,65,78
140 DATA32,32,38,32,32,66,82,85,67,69,32,77,67,78,65,77
150 DATA65,82,65,32,13,13,13,67,47,79,32,83,46,67,46,85
160 DATA46,71,46,44,13,80,79,83,84,32,79,70,70,73,67,69
170 DATA32,66,79,88,32,49,53,49,52,44,13,73,70,86,69,82
180 DATA67,65,82,71,73,76,76,44,13,70,69,87,32,90,69,65
190 DATA76,65,78,68,46,13,13,13,0,0,0,169,189,133,95,169
200 DATA8,133,96,169,179,133,90,169,11,133,91,169,0,133,88,169
210 DATA200,133,89,32,191,163,32,10,205,108,2,160,162,6,189,164
220 DATA205,149,131,202,208,240,134,143,169,5,141,32,208,169,9,141
230 DATA33,208,169,7,141,134,2,32,68,229,169,40,160,205,76,30
240 DATA171,234,13,32,32,32,32,32,32,32,32,10,83,84,65,82
250 DATA45,76,79,65,68,32,86,51,46,57,32,65,67,84,73,86
260 DATA65,84,69,68,13,13,87,82,73,84,84,69,70,32,30,32
270 DATA82,69,76,69,65,83,69,68,32,70,79,82,32,80,85,65
280 DATA76,73,67,32,68,79,77,65,73,70,32,66,89,13,13,32
290 DATA32,32,32,32,32,75,69,78,32,72,79,70,70,77,65,78
300 DATA32,38,32,66,82,85,67,69,32,77,67,78,65,77,65,82
310 DATA65,13,13,13,0,234,234,32,171,205,32,179,205,32,192,205
320 DATA201,42,240,26,96,56,233,40,56,233,208,96,230,122,208,2
330 DATA230,123,88,132,193,160,0,177,122,8,164,193,40,96,32,186
340 DATA205,201,83,240,15,201,78,240,17,201,80,240,10,201,75,208
350 DATA236,76,232,207,76,254,206,76,18,207,173,32,208,141,255,207
360 DATA32,23,248,169,7,133,1,120,169,193,141,24,3,169,254,141
370 DATA25,3,169,139,141,17,208,169,0,133,158,141,5,221,169,120
380 DATA141,4,221,169,129,141,14,221,169,1,141,5,221,169,74,141
390 DATA4,221,169,100,133,146,32,222,206,176,247,198,146,208,247,32
400 DATA222,206,144,251,32,139,206,133,195,141,249,207,32,139,206,133
410 DATA196,141,250,207,32,139,206,133,174,133,45,141,251,207,32,139
420 DATA206,133,175,133,46,141,252,207,166,196,228,175,208,6,166,195
430 DATA228,174,240,23,32,139,206,170,56,101,158,133,158,138,160,0
440 DATA145,195,230,195,208,226,230,196,76,86,206,32,139,206,197,158
450 DATA208,3,76,153,206,32,153,206,162,29,76,55,164,160,1,32
460 DATA222,206,152,42,168,144,248,141,32,208,96,165,1,9,33,133
470 DATA1,169,7,133,192,173,17,208,9,16,141,17,208,160,0,140
480 DATA14,221,88,169,71,141,24,3,169,13,32,210,255,174,249,207
490 DATA173,250,207,32,205,189,169,13,32,210,255,174,251,207,173,252
500 DATA207,32,205,189,169,13,32,210,255,173,255,207,141,32,208,96
510 DATA169,16,44,13,220,240,251,238,32,208,169,153,141,14,221,78
520 DATA13,221,78,13,221,144,251,173,13,220,41,16,208,1,24,96
530 DATA165,43,141,249,207,165,44,141,250,207,165,45,141,251,207,165
540 DATA46,141,252,207,173,32,208,141,255,207,32,56,248,169,6,133
550 DATA1,169,252,133,161,133,162,165,161,208,252,120,169,193,141,24
560 DATA3,169,254,141,25,3,169,139,141,17,208,169,0,133,158,169
570 DATA255,133,146,24,32,177,207,198,146,208,249,56,32,177,207,173
580 DATA249,207,133,195,32,152,207,173,250,207,133,196,32,152,207,173
590 DATA251,207,133,174,32,152,207,173,252,207,133,175,32,152,207,166
600 DATA196,228,175,208,6,166,195,228,174,240,23,160,0,177,195,170
610 DATA56,101,158,133,158,138,32,152,207,230,195,208,226,230,196,76
620 DATA189,207,165,158,32,152,207,76,153,206,160,8,42,133,16,32
630 DATA177,207,165,10,136,208,245,96,169,16,141,254,207,206,254,207
640 DATA208,251,96,165,1,9,8,133,1,238,32,208,162,20,202,208
650 DATA253,165,1,41,247,133,1,176,8,162,48,202,208,253,76,166
660 DATA207,162,32,202,208,253,165,1,9,8,133,1,162,20,202,208
670 DATA253,165,1,41,247,133,1,76,166,207,162,28,189,162,227,149
680 DATA115,202,16,248,76,131,164,234,234,234,234,1,8,255,159,80
690 DATA83,73,126,102,96,96,96,96,96,96,102,126,60,0,0,0
```


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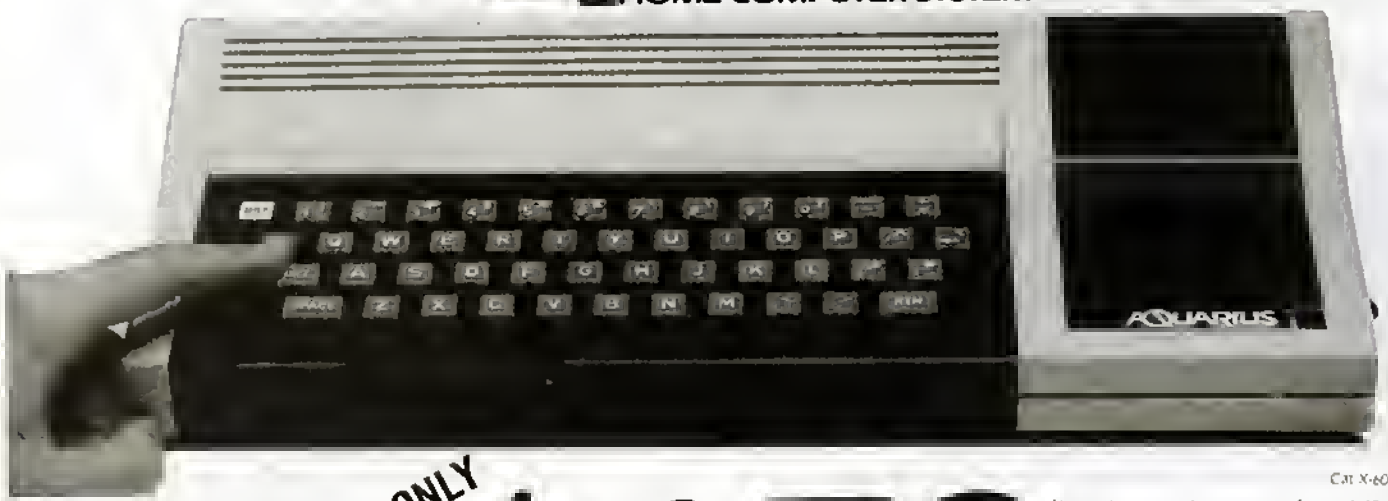

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BBC

Fast Key

By C. Fawcett

This is a utility program for producing keywords with a single key-press. Each letter key, and the punctuation keys ; : , . / will produce a keyboard when the TAB key is pressed.

Before entering the program, make room for the machine code by entering PAGE =&F00 and NEW. Save both the source and machine code with *SAVE"Fast key" 0D00 0F00 0E6B. To load with a tape system, type PAGE=&F00 and CH."Fast key", and to load with a disk system, type PAGE=PAGE+512 and CH."Fast key". The utility initialises itself on BREAK and sets the correct page.

```
10REM Fast key for BBC
  20REM Copyright C.Fawcett (1984)
  30PROCstring:PROCassemble
  40REM change keyboard vector
  50?&210=start MOD 256:?&211=start DIV
256
  60CALLinit
  70END
  80DEFPROCstring
  90point=PAGE-512
 100RESTORE
 110REM start address of data
 120FORloop=0TO31:READdata%
 130$(loop*8+point)=data%:NEXT
 140ENDPROC
 150REM data for keys (max lenght 8 cha
racters)
 160DATALOAD",CALL&,SAVE",CHAIN"
 170DATARIGHT$(,MID$(,AUTO,GCOL
 180DATACOLOUR,DATA,ELSE,FOR,GOTO
 190DATAGOSUB,INPUT,INKEY,GET,LEFT$(
 200DATAMODE,NEXT,OLD,PLOT,DEF,RUN
 210DATASTEP,TAB(,UNTIL,VDU,FN
 220DATAPROC,REPEAT,END
 230DEFPROCassemble
 240FORPASS=0TO2STEP2:P%=point+257
 250[OPTPASS
 260\ read key
 270.start:JSR&DEC5:BCCnext:RTS
 280\ if error return (Escape, etc)
 290\ Tab key ?
 300.next:CMP#9:BEQnext2:CLC:RTS
 310\Read another key
 320.next2:STX&71:STY&72:JSR&DEC5
 330BCCnext3:LDX&71:LDY&71:RTS
 340\Valid key after tab ?
 350.next3
 360CMP#&2C:BMInot
 370CMP#&30:BMIfirst
 380CMP#&3A:BMInot
 390CMP#&3C:BMIsecond
 400CMP#&41:BMInot
 410CMP#&5B:BMIthird
 420BNEnot
 430\Set up pointers to data
 440.first:LDX#&2C:BNEwrite
 450.second:LDX#&36:BNEwrite
 460.third:LDX#&38
 470\Write data to keyboard buffer
 480.write:STX&70:SEC:SBC&70
 490ASLA:ASLA:ASLA:TAX:LDA#&8A:CLC
 500\Read data until CR
 510.loop2:LDYpoint,X:CPY#&00:BEQnot
 520LDYpoint,X
 530STX&74:LDX#0:JSR&FFF4
 540LDX&74:INX:JMPloop2
 550\Return from routine
 560.not:LDA#0:CLC:LDX&71:LDY&72:RTS
 570\Self initialize
 580.init:LDA#PAGE DIV 256:STA&18
 590LDA#start MOD 256:STA&210:LDA#start
DIV 256:STA&211
 600LDX#key MOD 256:LDY#key DIV 256
 610JSR&FFF7:RTS
 620 \Sting command for Break key
 625\Change &E6B to 'start' if 'point'
is changed
 630    .key:EQUS"K.10CALL&"+STR$~init+"
M"+CHR$13
 640]:NEXT
 650ENDPROC
```


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Use the right word!

By Jay D. Mann

We all tend to use words in imitation of our friends, rather than in a strictly dictionary-approved manner. This is usually harmless at worst and perhaps enlivens our speech. On the other hand, when we use the wrong technical words, we confuse not only our listeners but also ourselves. At every computer club meeting I've been to, there has been at least one person tossing around terms like "disk" and "RS232" in a way that suggests he doesn't really understand what they are.

Let's look at "disks" — the round flat things (in square envelopes) that spin about. These devices, based on nothing more than rust and plastic, hold your precious data and programs. The disk fits into a black box called a "disk drive." This is the machine that spins the disks round and round. We hope it also sends and receives electrical signals that go to something inside or attached to your computer.

That something is the "disk controller". If your computer "has disks" then it has a disk controller fitted, plus a disk drive or two, plus a number of actual disks. Better yet, why not state just what you do have, e.g., "I have a disk controller but can't afford a disk drive yet."

Some recent home computers, particularly the dearer ones, have disk controllers fitted as standard. Some, at least, have sockets for them. Other computers need to have accessories added. Commodores are a special case: the software for disk operation is built-in, but they use an intelligent disk controller built into the disk drive case.

"Double-density" seems particularly confusing. First of all, every disk drive

Clarifying that density

made today is capable of double-density recording. Despite the name, the number of bits recorded per millisecond is no higher in double-density than in single-density recording.

What changes is that in double-density, fewer bits are "wasted" as clock bits than in single-density. This means more data recorded per millisecond. It requires a special disk controller plus associated electronics, to read and write double-density disks. Such disk controllers are also capable of running single-density, of course.

Finally, you need the correct software to drive the disk controller in the correct manner to produce either single or double-density operation.

Disks labelled "double-density" are disks (the round flat things, remember) that have met a higher standard of testing than single-density disks. The latter may well work in double-density operation but you have no guarantee against an excessive error rate.

Another area producing a flood of confusing jargon is the term, "RS232". This is inextricably confused with serial operation in the minds of many newcomers (and many who ought to know better). We'd better look at serial versus parallel operation first.

Inside your computer, either eight or 16 bits are moved between the memory, the CPU, and the rest of the hardware. These bits move on eight or 16 physical connections, all at once (we hope); in other words, in parallel. This is much faster than sending a byte one bit at a time. Consider a carriage return, Chr$(13) or 0D in hexadecimal. This has a bit pattern of 00001101. Parallel transmission sends the whole lot at once, typically in about one micro-second.

When we want to send the same byte to some device outside the computer, we may not want to spend the money for eight or more separate wires, plus earth plus "control" signals. It's all very well to put a multipin plug between a printer and a computer, but how would you like to pay for 10 simultaneous telephone connections for computer-to-computer linkups? The answer is to send the byte (0D for instance) one bit at a time via, essentially, a single pair of copper wires.

First, we send four zeros, then two ones, another zero, and a final one. At the other end, the computer or other device picks up each one or zero, and puts them back together into 00001101, and the data returns to parallel operation.

Pulling the bytes apart

Obviously, something has to pull bytes apart into bits and something has to put them back together again. The operation can be performed without anaesthesia by the computer itself, and often is in simpler systems. More usually, a dedicated integrated circuit called a UART or SIO is used to do the job. The process is called parallel-to-serial and serial-to-parallel conversion.

In every UART or SIO I know of, the signals come out as TTL levels — a zero

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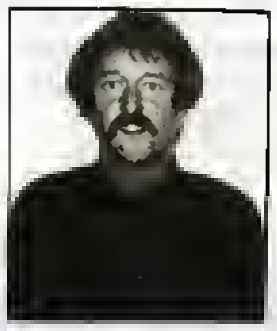

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bit has less than half a volt while a one bit is more than two volts. The trouble is that TTL signals are not particularly suited to being sent down long wires. So we have to change this local signal into another form better suited for transmission.

The RS232 specifications are rather old, as these things go, but they work for cables of at least 20 metres and usually much longer. Because RS232 was written in the dark ages, it uses voltage levels not really suited for modern electronics. A zero bit, quaintly called a space, is represented by voltage higher than three volts and less than 12. A one bit, or mark, is given by a voltage between −3 and −12 volts.

That's the theory. In practice, almost all existing RS232 receivers will accept a voltage of 0 as a one bit or mark. This means you can often make a homebrew RS232 output merely by inverting a TTL signal through a CMOS inverter with an output toggling between five and 0 volts. Some proprietary equipment just might not accept 0 volts, so be warned.

(Incidentally, the resting state of an RS232 line is with the negative-voltage mark asserted. This was so that the telegraph operator could be alerted is hostile forces cut the telegraph wire. Mechanical teleprinters kick up an enormous racket unless they are kept quiet by a continuous mark voltage).

Another way to transmit signals down a wire is to use the 20-milliamp loop linkup. Instead of flipping voltages, we turn a current off and on, and use an optoisolator or relay at the other end for reception. The current loop standard was originated to drive the magnet of mechanical teleprinters, just to give you an idea of its age.

Interestingly enough this antique method is actually superior to RS232 for fast data rates over long lines. It can also provide good electrical safety against voltage transients. The Post Office doesn't approve it because it messes up adjacent phone lines, but it can be quite satisfactory in a dedicated setup.

A couple of loop standards

Two new current loop standards, RS422 and RS423, have been devised to replace RS232. A lot of new commercial equipment has RS423 circuits that have been patched to simulate RS232. Basically, RS422/423 involves much smaller currents than the old 20-milliamp method, and more sensitive receivers.

None of the standards really specifies the kind of plugs and sockets to be used. Traditionally, a fairly pricy 25-pin D-connector has been used for RS232 hookups, although no more than five of the 25 pins are actually connected and small computer systems use only three of them. A recent DEC terminal uses a small seven-pin connector to do the same job. (What kind of connector does a 1000kg gorilla use on his computer? Answer: Any kind he darn chooses!)

There is a supplementary standard for the RS422 connectors that calls for 35 (sic) pins. Instead of counting sheep tonight, try to think of what sort of device-to-device connection might require 35 different sorts of data and control signals.

Serial communication requires all sorts of decisions. Seven or eight bits. Parity? Odd or even parity? Even if you don't make these decisions, somebody has had to. At the very least, you will probably have to select baud rate (better known as bps or bits per second). For most modems, 300bps is used. Videotex uses 1200bps in one direction, 75 in the other. Serial printers (a vanishing breed) often run about 1200bps. Video display terminals linked to larger computers can go up to 19,200bps but are usually between 1200 and 4800bps.

So please remember, don't go around asking for a "RS232" board for your computer, when what you really require is a parallel-to-serial converter. You might, in fact, need a simple TTL or 20-milliamp connection to the outside world without ever going into the inverted voltage levels of the real RS232 standard.

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Each article in this series is a gentle introduction to some topic in the computing field. It is written for the beginner, so may appear very simple to the rest of you. If you find it too easy, and so not worth reading, congratulations — you are a beginner no more. Each issue will deal with a different topic, of general interest. Occasionally, material may seem to repeat what has already appeared in "Bits and Bytes". But remember, new readers are coming along all the time.

Avoiding trouble with disks

By Gordon Findlay

The trouble with disks is that they are fragile! Even with very careful and conscientious handling, it is easy to damage a disk so that it cannot be read – thereby losing the information on it forever.

Lost data can be merely a nuisance, or, in the business situation, almost mean bankruptcy if it includes, for example, all the accounts! No matter what the situation, damage to a disk invariably means loss of time – and you know what they say time is!

The most common sources of damage to disks are avoidable. The tolerances involved in reading and writing to a floppy or hard disk are so small the smallest particle of dust or oil from a fingerprint can make a disk unreadable. Here are some things to avoid:

• Dust is dangerous! Don't leave disks exposed to airborne dust. A good rule is that a disk should be in its drive or its envelope. A disk should not be left on a desk to collect dust from the air, or worse, from the desk surface. Remember that in a single-sided drive, the side that is recorded is the bottom one – not the one with the label.

• Smoke is as bad as dust. Smoking while using a computer is definitely not recommended. Of course, in the good old days (seven years ago) when computers were mainframes and had special rooms, a person smoking wouldn't get near the machine.

• Don't touch the disk surface itself! I know your fingers are scrupulously clean, but even clean fingers leave traces of oil.

• Bending a disk is likely to flake off some of the oxide coating – bad news. Pressure on disks caused by squeezing lots into a box, placing heavy objects like books on them, using paper clips, rubber bands or other rough handling will squeeze the edges of the jacket together and prevent the disk from turning. I've seen this several times, and occasionally managed to use surgery on the jacket to allow the disk to be copied onto a new one. But more often than not, no recovery has been possible.

• Everyone knows not to write on the label once it's on the disk but sometimes we have to. Use a felt-pen, carefully. Don't stick a label on top of an old one – carefully peel the old one off first. Don't use a rubber on a disk label – think of the dust!

• Magnetic fields erase disks, of course. There are magnetic fields of around telephones, monitor screens, loudspeakers and magnetic memo holders, among other things. At least one unfortunate acquaintance has found a disk with a memo attached to a filing cabinet by a large magnetic clip. The disk didn't look damaged!

• Sending disks through the mail can be successful, but packing needs to be secure. Use a thick piece of cardboard on each side of the disk and slightly larger to avoid bending. Put the whole "sandwich" in a posting bag with bubble padding to avoid pressure damage. There are also commercially made disk mailers.

• Disk head cleaning kits are commonly sold. There are several types. Some have a dry sheet of cleaning material, others impregnate the material with a liquid before use. Some drive manufacturers do not recommend the kits, others recommend cautious use. Too frequent use can certainly contribute to rapid head wear. If you do use one, stick to the instructions, and do not over-use.

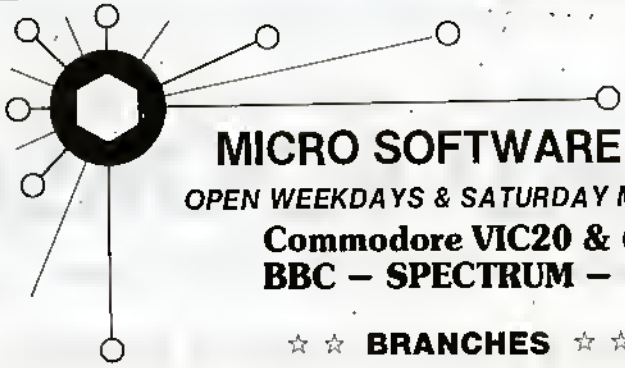
• There is also controversy over using the back side of a single-sided disk. There are good reasons for not using the reverse, but on the other hand lots of people do! Caution is recommended. Dysan Corporation, one of the largest disk manufacturers in the world, does not make a "flippy" disk, and warns strongly against using the reverse of a single-sided disk. Perhaps we can only advise caution.

Even with the greatest care, accidents do happen. One of the worst losses I have had was caused by a child unexpectedly sneezing! The best precaution is to keep a back-up copy. At a suitable interval, make a copy of your work. What is a suitable interval? That depends on your application. Certainly, in a business situation, it should be short enough to allow reconstruction of an up-to-date set of files system from the latest back-ups without great delay, by reprocessing just the work since the disk was last backed-up.

In word processing, save the file when you've done more typing than you want to repeat, and back-up frequently. In most operating systems, there are commands to allow copying of only the files on a disk which have been changed since the last back-up. Major software packages should have automatic or semi-automatic back-up provisions.

With care, disk storage is quick and reliable. But in a medium in which a piece of track just 0.3mm wide and 0.76mm long, can store 130 bits, and the loss of just one bit can render the whole disk useless, care is obligatory!

If it's micro news in Wellington — Phone Pat Churchill 797-193



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In defence of Sandy

By John MacGibbon

As someone who has used a Sandy word processor on an Apple II Plus for several years, I am writing to protest at the cavalier treatment given to this product in the *Bits & Bytes* survey (August edition) of microcomputer word-processors.

The program has everything I need as a professional writer, yet it is also very easy for beginners to use. My kids have used it since primary school and were singularly unimpressed with Bank Street Writer, the simple word processor designed particularly for family and school use.

The *Bits & Bytes* comparison chart is incorrect in three areas.

It says Sandy's screen display doesn't "match the printed font". Now this is technically correct if the writer means that if you want to print Roman, the screen will show Roman. Or if you want to print in Helvetica, the screen will show Helvetica and so on.

In fact, none of the programs surveyed can display the printed font: you need an Apple Macintosh for that trick.

I believe the reviewer meant an ability to display, on screen, how the text will ultimately be positioned on a print out. In this context, Sandy definitely rates a "yes". And it's a better yes than many other programs, because it shows exactly where page breaks will occur.

The comparison chart placed a question mark against the ability to "issue special printer commands". The answer should again be "yes". It is possible to embed commands to just about make a printer talk, and these are demonstrated in files included on the program disk.

Again there is a question mark against the ability to "modify printer drive routines". The answer should be a qualified "yes". The installing program for Sandy does allow some flexibility to suit different printers. It is certainly not as flexible as Wordstar, but it is sufficient to allow most popular daisywheel and dot matrix printers to be used — including NEC, Epson and C-Itoh.

Your reviewer feels the search and replace function on Sandy is limited and clumsy. I disagree. The only thing it can't do is search above the position of the cursor. You can only search downwards from the cursor — not that that has ever bothered me. In truth, upward searching is generally found only on expensive dedicated word processors.

The Sandy "replace mode" allows you to choose very simply from "replace", "don't replace", "replace all instances", "replace and end" and "terminate". What more do you need?

The review obviously had to be very general, but it would have been nice had there been room to include some of Sandy's strengths, including the fact you are always in insert mode. You don't have to waste time and break your stride switching between different modes to do different things.

It is worth noting there are now two versions of Sandy available: a universal version, and a IIe version. The latter has a number of enhancements and a vastly improved instruction manual.

Other plusses for this program include extremely fast loading and saving of files and the ability (in the IIe version) to define printer control characters, common "boiler plate" phrases etc in a glossary, allowing instant one-keystroke insertions in your text.

Moving and merging blocks of text is very easy, particularly with the IIe version, and the program includes a mailer. The IIe version includes a "print to disk" feature that will format text ready for transmission by modem.

Another important Sandy feature (missing on many other word processors) is an ability to alter print formatting default options.

Files can be given long and descriptive names — which never have to be typed out again because file catalogues appear with a letter beside each file title. Just press the letter and you've got the file.

Sandy word processor is written in Australia where genuine Apples are being greatly outsold by Apple compatibles. Because author Sandy Donald knows which side his bread is buttered on, he has updated the universal version to work with the Lingo 128, Basis Medfly plus "Apple Copy". It can also be configured to Taiwanese 80-column cards, as well as more standard brands such as Videx and Vision 80.

The best compliment I can pay this program is that for me, it is totally transparent in use. It is fast and I never have to think about it. At various times, I have looked seriously at the competition just to see if I was missing anything. I've always gone back to my old Aussie mate.

Seriously, I believe that anyone prepared to spend $300 for Applewriter II or $595, plus a Z80 card for WordStar, has got to be out of their mind, when Sandy is available for between a quarter and half the price. The only excuse I can think of is they have some very specialist use only a more expensive program could satisfy.

Sandy has only recently been on general sale in New Zealand, although it has been available to schools for several months. The (pre-devaluation) price to the general public was $150 for both versions. It is available from Ceta Resources, Box 13225, Christchurch.

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More on benchmarks

By Alex Bridger

Last month, we examined times taken for running different functions, different types of arithmetic and some benchmark programs including Eratosthenes sieve. This month, we will fill in the picture for the remaining benchmark programs, reporting some results for other micros and giving some tips on speeding up your Spectravideo programs.

We believe the benchmark programs at the end of this article were first published in Kilobaud in 1977 (eight years ago — not quite the computer stoneage!) test the speed of certain basic routines repeating them 1000 times to get a measurable time.

BM1 times a 1000 empty FOR . . . TO loops; BM2 one thousand IF statements; BM3 and BM4 a thousand floating point and integer arithmetic operations with each of the four operators; BM5 one thousand GOSUB branches; BM6 is a preparatory stage for timing matrix creation steps in BM7. BM8 was discussed in last month's article where it was used to time the transcendental functions, plus others. BM9 is Eratosthenes sieve, not one of the "official" benchmarks simply my naming convenience.

Table 1 lists the times of various microcomputers. However the source of some of this data is uncertain, it is extracted from an unpublished company performance evaluation memorandum, and the times for some of the other machines may not be exactly comparable because of the types of arithmetic to which each machine defaults (this was discussed in last month's article); the Spectravideo and IBMPC times are all for double precision arithmetic (the slowest type). The Spectravideo defaults to double precision whereas the PC defaults to single. For the SVs, single precision reduces the times by 3-5%.

Examining these results gives a different perspective of the relative perfromance of different machines compared to running only Eratosthenes sieve. Last month, it was shown that the Spectravideo was the fastest on the sieve — even faster than the mighty PC. However Table 2 shows there are differences between the micros with Atari and Spectravideo weak on the trig functions, and the PC significantly faster than the others on these functions. I also ran BM8 on the new IBM PC AT and XT to get 14.1 and 28 seconds respectively.

To arrive at a summarising performance factor for each machine, I used the IBM PC times as the standard for comparison, then finding the deviation from this for each benchmark and taking the mean of these deviations for each machine. This treats each benchmark as an independent event, giving equal importance to each result.

It is hardly fair to include the Sharp results since this is a small 4.5K RAM pocket computer. Just for interest, a compiled version of the sieve (BM9) was run on the Kaypro resulting in a 62% saving in time for that machine. The Atari 400 was a 64K expanded model with one 32K bank deactivated. I would be pleased to receive times for other machines done with double and single precision arithmetic.

TABLE 1: Benchmark times (seconds)

	SV319/328	Apple2E	IBM PC	Commodore64	Atari400	Kaypro2	Sharp1401
BM1	2.2	1.3	1.6	1.6	2.4	1.7	14.
BM2	5.6	8.5	6.0	9.9	7.0	5.7	74.
BM3	18.3	16.5	33.0	18.4	22.6	15.6	160.
BM4	19.9	17.8	33.1	20.2	22.5	15.0	164.
BM5	20.9	19.1	34.2	21.7	25.5	16.6	176.
BM6	33.1	28.6	44.4	32.3	27.5	30.0	269.
BM7	44.8	44.8	58.2	50.9	27.6	47.5	430.
BM8	236.3	107.	38.4	116.7	423.	81.5	830.
BM9	179.	223.	190.	338.	na.	250.	na.

TABLE 2: Deviations

	SV318/32B	Apple2E	IBM PC	Commodore64	Atari400	Kaypro2	Sharp1401
BM1	1.38	0.81	1.0	1.0	1.50	1.06	8.8
BM2	0.93	1.42	1.0	1.65	1.17	0.95	12.3
BM3	0.55	0.50	1.0	0.56	0.68	0.47	4.9
BM4	0.60	0.54	1.0	0.61	0.68	0.47	5.0
BM5	0.61	0.56	1.0	0.63	0.75	0.49	5.1
BM6	0.75	0.64	1.0	0.73	0.62	0.68	6.1
BM7	0.77	0.77	1.0	0.87	0.47	0.82	7.4
BM8	6.15	2.79	1.0	3.04	11.02	2.12	21.6
BM9	0.94	1.17	1.0	1.78	—	1.32	—
AVG DEV	1.41	1.02	1.0	1.21	2.11	0.93	8.9

I wish to acknowledge and thank M. Foster, M. Livingstone, P. Logan, B. Goldstone who helped me with their machines and results.

There are many small things you can do to speed up your programs; there are also a number of important features to be looked for in IF statements, loops & logic control.

On the elementary side you can:

• Combine lines using the colon as a separator and taking advantage of the full 255 byte statement length limit. For example, changing the seven-line BM2 program into a four line program gave a 20 millisecond time saving per line saved. That may not sound much but they are simply lines. Longer lines will save more.

• Use remarks sparingly — usually only recommended if no one else has to follow your program or the REMs can be up front or at the end. The time cost is much smaller (so don't get carried away with this one), about 1 millisecond per 22 byte REM, can be significant if placed inside a big loop.

• Use simple arithmetic. Quantitative detail was supplied in last month's article with one of many unstated conclusions that using addition and subtraction in preference to multiplication & division saved time. Eg. use Z=X+X instead of Z=X*2 and Z=X*X instead of Z=X^2, each is three times faster and save two and nine milliseconds respectively.

• Don't repeatedly evaluate the same expression. If it is necessary to calculate a similar set of calculations at various times, set a new variable equal to the part of the calculation which is the same. Eg. replace S=K*K+4/2: TT=K*K+6/2 by U=K*K:S=U+4/2: T=U+6/2. This example saved three milliseconds per pass. The precision of the arithmetic required also can be used to save time (see last month's article).

• On the Spectravideo, as with some of the other microcomputers that have Microsoft BASIC, every FOR . . . TO loop does not need to have a closing NEXT statement with the looping variable specified eg. FOR K=1 TO 5:. . . :NEXT. This saves only 0.4 milliseconds per loop i.e. two milliseconds for this example.

• Don't place any unnecessary program steps inside loops. This can be most profitable for optimising your program times, after you have the program logic sorted out. My suggestion is to concentrate first on the big loops. Big loops are ones that have a large repetition index.

These simple techniques may appear to save very little time, however there are certain situations and applications like action games where these savings are noticeable and effective.

Benchmark programs

Starting with BM3, BM2 simply has line 50 deleted. BM1 then has lines 30 & 40 deleted & line 60 replaced by FOR K=1 TO 1000 and NEXT K.

Then starting with BM7, delete line 80 to get BM6, then dete lines 70 & 90 to get BM5, then delete line 60 & line 130 and get BM4.

```
10 REM BENCHMARK 3
20 PRINT 'S'
30 K=0
40 K=K+1
50 A=K/K*K+K-K
60 IF K<1000 THEN 40
70 PRINT 'E'
80 END
```

```
 5 REM ERATOSTHENES SIEVE
10 DEFINT A-Z
20 SIZE= 8190
30 DIM FLAGS(8190)
40 PRINT 'only 1 iteration'
50 COUNT=0
60 FOR I=0
70 FLAGS(I)=1
80 NEXT I
90 FOR I=1 TO SIZE
100 IF FLAGS(I)=0 THEN 170
110 PRIME= I+I+3
120 K=I+PRIME
130 IF K>SIZE THEN 170
140 FLAGS(K)=0
150 K=K+PRIME
160 GOTO 130
170 COUNT=COUNT+1
180 NEXT I
190 PRINTCOUNT;'primes'
```

```
10 REM BENCHMARK 7
20 PRINT 'S'
30 K=0
35 DIM M(5)
40 K=K+1
50 A=K/2*3+4-5
60 GOSUB 100
70 FOR L=1 TO 5
80 M(L)=A
90 NEXT L
100 IF K<1000 THEN 40
110 PRINT 'E'
120 END
130 RETURN
```

```
10 REM Benchmark 8
20 PRINT 'S'
30 K=0
40 K=K+1
50 A=K^2
60 B=LOG(K)
70 C=SIN(K)
80 IF K<1000 THEN 40
90 PRINT 'E'
100 END
```

Sector Alpha: it's different

by Alex Bridger

Here is a fighter pilot simulator game that's different from the usual (mind you so is the price). The setting is three different mountainous landscapes from a planet somewhat reminiscent of science fiction film settings of a different solar system.

You are required to defend your planet against invading alien Tie fighters that attack you regardless of which of the three sectors your craft happens to be in. Three radar screens give you the overall view of the mounting attacks, indicating which sector will next require your attention. You launch missiles at the incoming fighters which in turn launch missiles at you. These enemy missiles very realistically grow as they get closer and can he evaded only if you act soon enough before they smash into your cockpit and terminate one of your five lives.

The most fascinating aspect of this game is the realistic shifting of the scenery in response to your aircraft joystick movement. (I have never flown a Skyhawk to compare the feeling but it's not too dissimilar to light aircraft flying).

A beginner pilot feels considerable overload of information (the scoring is tricky) but with half an hour of dual instruction and two hours solo, the game becomes straightforward but still fun. (After a week we were in the six-figure class).

The cost – around $130 for this ROM cartridge – is the main drawback for such an enjoyable game. However, sharing one between five people who live reasonably close can reduce this. It runs on the SV318 or 328 with no attachments. Beware of buying this sort of game in Australia in Sydney, it was priced between $NZ105 and $170 before paying up to 80 per cent customs duty!

Errata & a note

In last month's article, I noted that the sieve was, among other things a test of the Basic Compiler. I should have said the Basic Interpreter.

I also mentioned that the Spectravideo 2 Byte TIME counter ran at 50 cycles per second — not quite, it is 50.16+−.05 seconds. The counter will therefore run over and start again every 21 mins 46.5secs making it an awkward clock for any times greater than 21 mins. Ouestion: Do the American SVs have clock counters that run at 60 cycles per second as per the SV manual, and does this mean New Zealand (and Aussie) SVs are therefore 16% slower than US machines?

Several queries on the Spectravideo have been received and will be dealt with in future articles but further suggestions and ideas are most welcome. Please write to 11 Mawson St. Lower Hutt.

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DECdirect – a toll-free service which allows Digital customers to order accessories and supplies direct – is now operating from Auckland (09) 596-991. Customers can ring their orders free from anywhere in New Zealand.

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Commodore — plain sailing?

By Steven Darnold

When I bought my PET in 1979, Commodore was a relatively small company. Apple and Tandy had the lion's share of the microcomputer market, and Commodore was way behind in third place. In fourth and fifth place were the newcomers, Atari and Ohio Scientific, and at one stage it appeared they would overtake Commodore and knock it even further back in the order.

Commodore, however, was determined to succeed. It strove to modify the PET and develop new products. First, it put a new keyboard on the PET and upgraded the BASIC. Next, it changed the screen from white to green and added more memory. Then it upgraded the 8ASIC again; increased the 40-column display to 80 columns; and increased the memory to 96K.

All this reshaping of the PET was too late for the American market. The Apple II and TRS-80 were well established, and the PET didn't make much headway. However, the microcomputer market was slower to develop in Britain and the modified PET was very successful there. It rapidly became the number one business microcomputer.

In America, Commodore went all out for the home market with the VIC-20. It had colour, graphics, and sound, but the most imoortant feature was its low nrice. The VIC was a great success. However, it was clear from the beginning that the VIC was severely limited by its 22-column screen and small memory. Nobody was surprised when the Commodore 64 was announced.

So far, the progression from PET to VIC to C-64 has proceeded quite naturally. Although existing users of Commodore computers have been disappointed to lose compatibility, each new computer has been a logical progression from the last. Certainly Commodore has made mistakes, but the overall pattern has made sense. More recently, however, Commodore has lost its way.

Perhaps it's a coincidence, but Commodore's problems began a year ago, about the same time Jack Tramiel left the company. At that time, VIC sales were declining as the C-64 surged in popularity. Quite naturally, Commodore was thinking about dropping the VIC and producing a new computer. Unfortunately, it didn't have a clue what to produce.

It thought about producing a Z-8000 computer running Unix. It thought about producing an IBM clone. It thought about producing a portable computer with an LCD screen. It thought about producing a computer with built-in business programs and a built-in speech synthesiser. It thought about all sorts of things. Commodore simply didn't know what to do next.

In the end, Commodore decided to produce the C-16 and the Plus 4. This surprised me when I first heard of it because I simply couldn't see how these computers would fit into the scheme of things. The C-16 is certainly an improvement on the VIC, but the VIC is now so out of date such comparisons are irrelevant.

What matters is that the C-16 sells at the same price as the Atari 800XL, Electron, and Spectrum Plus. It simply cannot compete with these computers. They all have much more memory, and the first two have better graphics and sound. In addition, they all have lots of software, while the C-16 has practically none. If Commodore had released the C-16 in 1983, it probably would have been a great success; however, its prospects in 1985 look decidedly gloomy.

The prospects for the Plus 4 are not much better. It sells for more than the 64, but offers much less to the home user: inferior graphics, inferior sound and almost no software. It does have built-in business programs, but these are pretty limited and have been widely criticised.

The Plus 4's improved BASIC will appeal to programmers and teachers, but they will probably find the Electron much more attractive in this respect (and cheaper, too). Perhaps the 60K bytes free will attract some people, but overall I don't expect the Plus 4 to be a big seller.

It is always difficult for a new computer to become established. Software takes about a year to build up, and until then, even the most attractive computer is handicapped. To succeed, a new computer must either have lots of exciting new features, or standard features at a much lower price. Neither the C-16 nor the Plus 4 do this.

Both computers are aberrations; they do not point to the future; they do not indicate where Commodore is going. For this, we must look to recent developments. There, we will find, not just one pointer to the future, but two.

In January, Commodore exhibited a new computer at the Consumer Electronics Show. It has 128K of RAM, an 80-column screen, and an advanced new BASIC. All of the RAM is available to 8ASIC programs, with 64K allocated to the program itself and 64K allocated to variables and arrays.

This C-128 computer has no problem with software because it has two special modes. One mode will run 100% of C-64 programs; the other will run CP/M programs. Thus, the C-128 will arrive with a truly huge library of programs already available.

The second pointer to the future is the Amiga computer, which Commodore is due to exhibit soon. It has outstanding graphics and sound, but its most significant aspect is that it uses the 68000 microprocessor. This chip is already used in the Apple MacIntosh and Sinclair QL and is at the heart of the new Atari ST. It is likely the 68000 will become the standard microprocessor of the 1990s.

The C-128 and Amiga fit nicely into the Commodore line. The Amiga will take several years to become fully established, and in the meantime the C-128 will provide the expanded memory, enhanced BASIC and 80-column screen, which the C-64 lacks, without sacrificing software compatibility.

There's really no place for the C-16 and Plus 4. It's a waste of resources producing and advertising them. The sooner Commodore realises this, the better. This is particularly important

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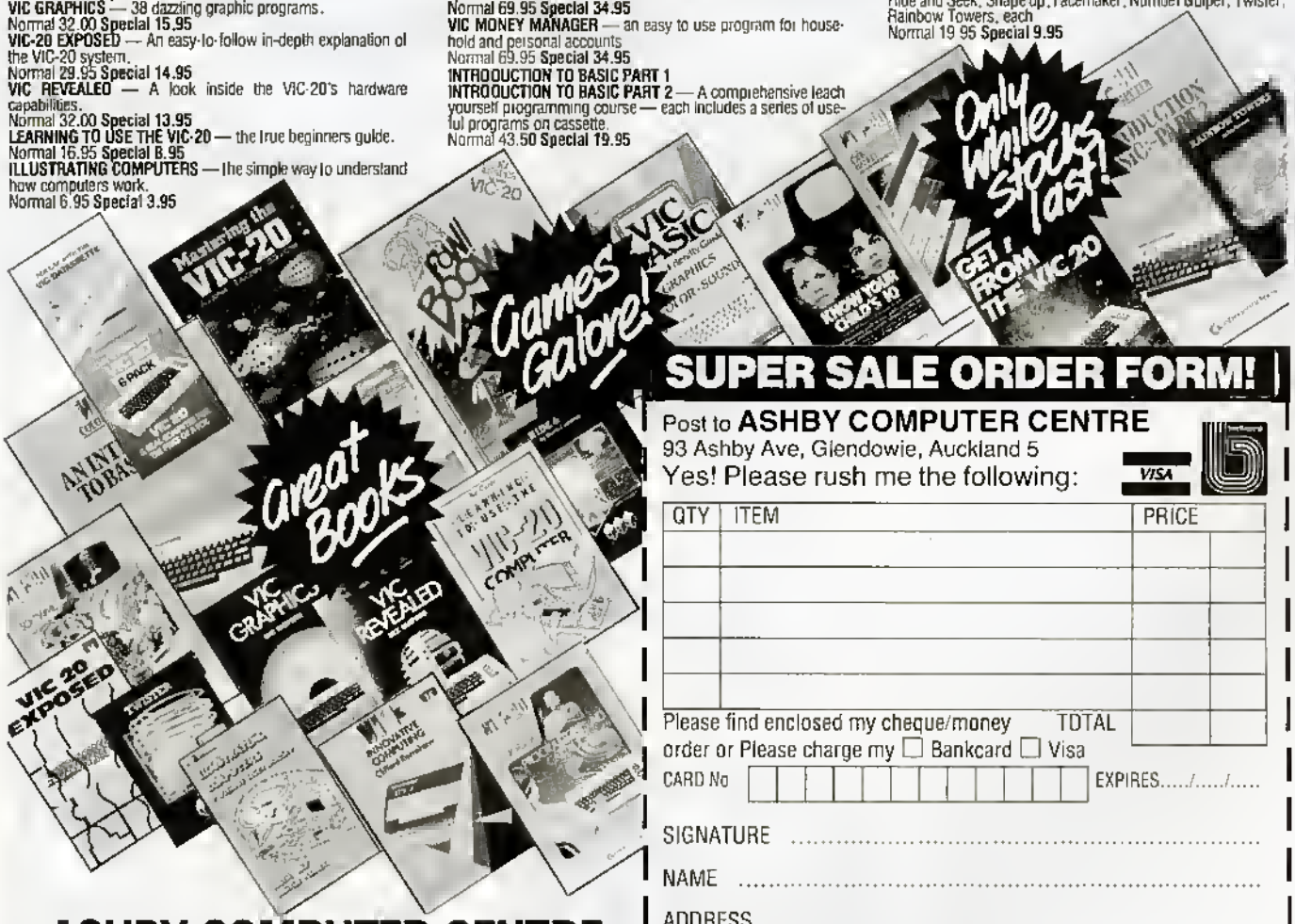

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Filing systems

By Dick Williams

This month, we will take a look at some aspects of filing systems and the way we can use them at home or in business. I will take you through the development of an easy filing program which you should find very useful.

First, we have to introduce you to strings. These are, as the name suggests, a string of characters. A list of names means very little to the computer, but the same list of names, when converted to strings, can be worked on by the computer in a wide variety of ways.

Strings provide the means for sorting names into alphabetical order, searching for a name in a list or finding information buried deep in a large quantity of information.

Here is the name of a string — A$. The $ sign indicates a string. Now we will name A$ equal to something:

A$ "BROWN H 75 EAST STREET 88754"

We can tell the computer that A$ = everything between the speech marks and any time we require this data, we tell the computer to print A$ and it will do so.

We can also have strings in this form: A$(1)= and A$(2)= and so on.

This is quite handy because we can have a whole family of strings all named A$ (a string) and differentiated from each other by the number in the bracket.

A$(1)= "BROWN H 75 EAST STREET"
A$(2)= "JONES D 4 GREEN LANE"
A$(3)= "ANDERSON S 12 BEACH STREET"

We have set up only three strings but we could have 50 or 100 or more depending on your computer's memory capacity and the length of each string. A hundred strings, each 100 characters long (about 3 screen lines), would require about 10K of memory. That's quite a lot of information and well worth organising a file program to store and retrieve it.

Assuming that somehow we have put the three strings, A$(1), A$(2), and A$(3), into the computer's memory, we will need a way to key in one letter. The computer should respond by printing on the screen, string 1, string 2 or string 3.

The easiest way to arrange this is to tell the computer to look at the letter we will be typing in, then look at all the strings in its memory (three) and print the one that starts with the letter typed in.

We need an input line to collect the letter from the keyboard:

40 INPUT "1ST LETTER OF NAME"; K$

When the computer sees this line, it will wait until you type in a letter and press the CR key. It will place that letter in K$ (K string). The next line will do the comparison of the letter typed in at the keyboard with the first letter of each string.

50 IF K$=LEFT$(A$,1) THEN PRINT A$

This compares K$ with the left-hand part of A$ for one position (which is the first left-hand letter) and if a match exists, the computer will print the entire string.

We now need some way to make the strings held in the computer memory go past the letter typed in from the keyboard so that a match, if one exists, can be noted by the computer and the matching string printed on the screen.

In addition, we have to tell the computer how to identify and keep track of the correct string so that when it prints a string on the screen, it is the one we want.

The FOR-NEXT routine will enable all the stings in the memory to be examined one at a time. This is used this way:

45 FOR P=1 TO 3
60 NEXT P

When these two lines are added to the others, the computer will be able to look at string one and see if the first letter matches our keyed-in letter. If it does, that string will be printed and the next string examined. If not, that string is put to one side and string number two checked.

This is a most important aspect of our file program and the exact method by which the computer is persuaded to look at each of the strings is not always clear to beginners. So just for the moment, we will concentrate on the lines of program which make it work:

40 INPUT "1ST LETTER OF NAME"; K$
45 FOR P=1 TO 3
50 IF K$=LEFT$ (A$,1) THEN PRINT A$
60 NEXT P

These four lines of code form the basis of the program but need a small alteration because the computer will be looking at A$ and we don't have an A$ in the memory. We have A$(1) A$(2) and A$(3) as defined previously but no A$.

We have to make an alteration to line 50 so that the computer will check A$(1) first then A$20 and finally A$(3). Note that the only difference between each string is the number in the bracket (1) (2) (3).

If we could find a way to alter this number each time the computer was looking at the strings, we would be right. Fortunately, there is a very simple way to do this. Note that line 45 is the start of a FOR/NEXT routine with P taking the values 1, then 2, then 3. This is just what we need to keep track of each string and is used this way:

50 IF K$=LEFT$(A$,1) THEN PRINT A$
50 IF K$=LEFT$(A$(P), 1) THENPRINT A$(P)

The two lines old and new are shown for comparison and the all-important difference is the inclusion of (P). When P=1 then A$(P) is the same as A$(1). When P=2 then A$(P) is the same as A$(2), and when P=3, A$P=A$(3)

The core of our first file program will now be:

40 INPUT "1ST LETTER OF NAME"; K$
45 FOR P=1 TO 3
50 IF K$=LEFT$(A$(P), 1) THENPRINT A$(P)
60 NEXT P

All we need now is a method of putting the strings into the computer. Although there are other ways, at this stage we will stay with the simple but effective method of giving a line number to each individual string.

```
10 A$(1)="BROWN H 75 EAST STREET"
20 A$(2)="JONES D 4 GREEN LANE"
30 A$(3)="ANDERSON S 12 BEACH STREET"
35 CLS
40 INPUT "1ST LETTER OF NAME ";K$
45 FOR P=1 TO 3
50 IF K$=LEFT$(A$(P),1)THENPRINT A$(P)
60 NEXT P
70 FOR H=1 TO 400:NEXT H:GOTO 35
80 REM H IN LINE 70 IS A DELAY
```

Type this all in and run. The computer will prompt for a first letter and since there are only three strings of information in the memory, you can respond with B, J or A and watch the relevant string appear on the screen.

Having used this program for a while you should find there are some limitations which will preclude using it for serious work. This is a big advantage in gaining experience in that you can see and be involved in the steps towards initiating and refining a rough program into a workable one.

The next step is to identify as far as possible any failings and to incorporate suitable modifications. First, we see that any further information added must be accompanied by an increase in the range of P. Suppose we add one further string; this will have to be A$(4) and line 45 would have to be FOR P=1 TO 4.

Otherwise we would end up with four pieces of information and the computer would look at only three of them.

An automatic counting mechanism is needed to keep an eye on the number of items of information. One way to do this is to make the computer count the strings and when it sees one at the end such as "LAST" or "END", it recognises there is no more information and stops the count at that point.

There should be a method of inputting more than one letter from the keyboard so that where there may be 10 or more names starting with the same letter, only the one of interest is extracted from the computer memory.

A small addition to line 50 to do this is:

50 IF K$=LEFT$ (A$(P), 1| ETC. OLD
50 IF K$=LEFT $(A1(P), LEN(K$)) ETC. NEW

The old line 50 allows a search to only one position, — the first letter — whereas the new line 50 allows a search up to as many letters as are typed in. LEN(K$) means length of K$. If there are names, Andrews, Abbot, Anderson and Anker in memory, inputting ABB would give a match with only Abbot.

It is also important, having found the required information, to be able to add to or alter any of it quickly and easily. In this type of program, the best way to do this is to place a pointer in the information so that you know where it is held.

10 A$(1)= "BROWN H 75 EAST STREET 10"

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By adding 10 somewhere in the string, we know immediately that it is held in line number 10.

Another point requiring attention is how to leave sufficient room for the strings. The way the program is means there is not enough space for other than a few more without running into the program lines.

One solution is to put the program first and the strings after it. This leads to another problem because when strings are before the main program, the computer automatically reads them on its way to the program. But if the strings are placed after the main program, it will not read the strings and has to be told to do so.

If you think you will have more than 10 items of information in your file program, it will be necessary to set aside space in the computer string storage area by using a DIM command.

DIM (short for dimension) reserves string space and must be done first. Suppose you intend making up a large file of 150 pieces of information, you will have to reserve at least 150 string places — DIM (150) and, to be on the safe side, 200 would be better.

Here is the modified file program incorporating aspects discussed and using data statements to hold the information. The computer will read each data line into an individual string.

```
5 REM ------FILE PROGRAM 2----------
6 REM ---READ DATA INTO STRINGS------
10 CLS:DIM A$(200):J=1
20 READ A$(J):IF A$(J)="Z END"THEN 40
25 J=J+1:REM COUNTING NUMBER OF DATA
26 GOTO 20:   REM SEE IF ANY MORE DATA

30 REM -------INPUT  PART------------
40 INPUT "1ST LETR(S) OF NAME ? ";K$:
BEEP:PRINT: REM K$ HOLDS INPUT LETR(S)

45 REM ----- SEARCH  PART------------
50 FOR P=1 TO J
60 IF K$=LEFT$(A$(P),LEN(K$))THEN PRIN
T A$(P)
65 NEXT P:REM SEARCH STRINGS FOR MATCH

68 REM -----SCREEN CONTROL-----------
70 PRINT :PRINT "     PRESS CR KEY FOR
 NEW NAME":BEEP
80 J$=INKEY$:IF J$<>CHR$(13) THEN 80
90 BEEP:CLS:GOTO 40: REM BACK TO INPUT

95 REM ----DATA STARTS NEXT----------
100 DATA JONES FRED 100  PHONE 88888
B/DAY 4/8/59. 23 GROVE LANE EAST.WORKS
 AT GRAY METAL PHONE 77777.  CHILDREN
MAX B/DAY 16/5/82 LYNDA 9/2/84
101 DATA
102 DATA
50000 DATA Z END
```

```
5 REM ------FILE PROGRAM 3----------
10 CLS:RESTORE :ERASE
15 INPUT "1ST LETR(S) OF NAME ? ";K$:
BEEP:PRINT
20 PRINT "DONT PANIC  I'M LOOKING"
25 FOR P=1 TO 1000:READ A$:IF A$="END
OF DATA" THEN 80
30 IF K$=LEFT$(A$,LEN(K$)) THEN PRINT
A$:BEEP
35 REM SCREEN CONTROL LINES 40 TO 65--

40 GOTO 65
45 N$=INKEY$:IF N$="" THEN 45
50 IF N$=CHR$(13) THEN BEEP:GOTO 10
55 IF N$<>CHR$(32) THEN 45
60 PRINT "RUN":GOTO 70
65 N$=INKEY$:IFN$=CHR$(32)THEN BEEP:PR
INT:PRINT"HALTED--SB TO CONTINUE   CR
TO NEW":FOR Z=1 TO 100:NEXT Z:GOTO  45

70 NEXT P
75 REM ---------NEW NAME-------------
80 PRINT :PRINT "     PRESS CR KEY FOR
 NEW NAME":BEEP
85 J$=INKEY$:IF J$<>CHR$(13) THEN 85
90 BEEP:CLS:GOTO 10
100 REM -----DATA STARTS NEXT---------

101 DATA THIS IS WHERE THE DATA GOES.
ALL THIS WILL BE PRINTED ON THE SCREEN
 IF THE KEY LETTER T IS TYPED IN.ANY
OTHER DATA STARTING WITH T WILL ALSO
BE DISPLAYED.101 LINE NUMBER POINTER.
NO COMMA'S IN DATA.Lower case NUMBERS
1234567890----------------
4000 DATA THOMAS 4000  RADIO/CASS OK J

4003 DATA JAMES 4003 CAR STEREO OK   J

50000 DATA END OF DATA
```

This program will enable you to store and retrieve all sorts of data all keyed from the left-hand letters of the data. You can have abut 235 characters per data entry but do not use commas anywhere within the data.

Leaving a space between the word data and the first letter of the actual data allows you, when prompted for the 1st letter(s), to input a blank by pressing the CR key and the search will key off all the spaces and print the entire list of data.

If you find that one group of 235 characters is not sufficient to hold all particulars on an item, it is quite feasible to have a second data group using the same left-hand key word. To illustrate this point, here are a few entries from my deep freeze file: 120 data meat120 sausages lambchops shoulder b/qsteaks mince sirloin jan 121 data meat121 chuckstuck potroast cornedbeef porkchops steak&kidney feb.

There is a lot more data than shown here — about 20 data sets, each six screen lines long, listing everything in the deep freeze in categories (meat, chicken, fish, bread, veges, fruit etc) and when we should think about eating it.

You could keep a file of all your friends and relatives with address, phone number, birthday etc. For business, there are several applications: you can keep a record of goods sold to help maintain minimum stock levels; you can retain records of stock ordered and when it is scheduled for delivery to control company debt.

At work, we have started putting customer repair work on file using the job number as line numbers. When customers ring in to see if their TV or other equipment is repaired, we have only to key in the first one or two letters of their name to see if it is finished:
3516 DATA JAMES 3516 PHILIPS CTU OK H
Keying in J presents JAMES 3516 PHILIPS CTV OK H on screen. This tells whoever has answered the phone that the colour TV for James is OK, plus the job number and who repaired it. This simple line of information helps tremendously in the smooth running of the service department. When the repair is picked up and paid for, the data is erased.

This type of file system is ideal for small companies requiring efficient systems but unable to afford dearer equipment.

The only problem I have found with this file program is that all data is read into the strings at the beginning of the program, so the same information is, in effect, held in two places in the computer's memory — once in the line numbers and also, after program run, in the computer string storage area. This is not good because it halves the amount of data which can be stored.

I decided the loss of memory could be avoided by making the computer read each data statement one at a time so that only one string would be active at any given time. This approach produced the desired effect of doubling the data storage capacity, plus several other advantages — the DIM statement is no longer required and the search code is even shorter.

There are four additions to this program. The first is a way to halt the screen scrolling so that you can study the information; the second is a don't panic message; the third is RESTORE; and the fourth is ERASE.

The first two are straightforward and RESTORE and ERASE control the string storage area. RESTORE is vital because, having read the data once, the computer, in effect, hides it. RESTORE does as its name suggests — it restores the data and allows it to be read again. ERASE clears the string storage area of any previous strings or remnants of strings.

When using this program for business, I abbreviate the data as much as possible to conserve the computer memory. I try to cram each data entry into one screen line using the right-hand edge of the screen as a stop.

There is not much point in having a lot of information in each data entry if you run out of memory. In addition, compact data means less time in loading and saving programs to cassette. At home, the file can hold a lot of data with all relevant information noted in the data lines, while for business purposes, one main use is to provide fast access to important information, particularly for small companies.

Next month, I will show you how to adapt this program to keep track of costing for job tenders and material costs for work in progress.

Record year

Burroughs Corporation had record orders and revenue last year. Revenue worldwide was up 11% to $US4.8 billion, and net income up 24% to $US244.9 million.

Paths for a growing Beeb

By Pip Forer

Last month, we spent some time speculating on where Acorn might go next with new model Beebs. 1985 has started with a lot of developments on the other front: how to expand the system you have. Three new options in particular may interest BBC and Electron owners.

One is the announcement by Watford Electronics of a 32K RAM/ROM card. The nicety with this particular beast is that it can double in two very different roles – it can support screen memory in the style of boards such as the Aries board, or it can be used to hold ROM software downloaded from disk. The switchover is software controlled.

This means the user can enjoy greatly enhanced program space in the high resolution graphics modes or equally, avoid congestion on the ROM slots by flipping utilities in and out of the RAM as required. For network users faced by the new LOGO and PASCAL in twin RDM sets, the 32K size seems ideal.

A second development is the announcement of the new ADFS (advanced disk filing system). I had a chance to evaluate one of these on the new Electron disk drives, and found both the ADFS and the 3.5in drives impressive. For Electron owners, the drive is especially nice, clipping rigidly to the side of the machine and making a very compact and manageable unit. The disks are of the same capacity as an 80-track disk but come in the currently favoured (and far more robust and storable) rigid, self-sealing disk cases used on many recent business machines.

The ADFS is not designed just for the 3.5in format however, but as an alternative system on any BBC drive. It uses the same disk access commands from BASIC as the original DOS but offers several enhancements, including a fully-fledged directory structure, fewer problems with file extension and the availability of far more and longer file names. In fact, as predicted in this column a while ago, it is very much a single user version of Econet II.

The directory system is a vast extension on DOS, where the only directory names allowed are single characters (i.e. V.MYWORD or $.SCRAM). Each directory name can be 10 letters long and directories can be nested, as in $.STELLA. DATA. CASHFLOW. Options in the system allow the programmer to drop users into particular directories at boot up time. This has implications for uses such as assessment sessions in an educational environment where it is now simple for each student to have his or her own dedicated area of disk to store records.

ADFS disks are physically structured differently from DOS ones, but utilities are provided for passing files either way between the two systems. ADFS disks are also differently structured from Econet disks, but the similar file conventions on both systems should make transfer of programs developed on a single user system on to Econet simpler than for DOS (not that there is much to it anyway in many cases).

ADFS and the Electron drives are not expected in quantity until early winter. Even further away, but of interest if you are really worried about RAM space is Acorn's rumoured new C – a machine with a built-in modem using the 16-bit 65CB16 chip, as pin-compatible chip that runs the 6502 instruction set but has an address space of 16M6 (see *Acorn User*, January 1985). Did someone say this could become a crowded corner of the marketplace?

Believed to be closer is the 32016 co-processor still yet to be sighted outside of Cambridge. The official Acorn specification sheet is in circulation and read very well for the devoted programmer. With 256K RAM, the 32016 in the co-processor runs at 6MHz and will include the 32-bit floating point arithmetic chip as standard. It will also come with BBC BASIC, C, Fortran, LISP and PASCAL as standard. All the languages but the BBC BASIC version will support the 32-bit precision arithmetic. The operating system for all the languages except the BASIC is PANOS. Rumoured to be the name of an exclusive Greek restaurateur in Cambridge rather than anything more gradiose.

Perhaps sensibly given its market, this is a proprietary system and reportedly supports all the latest conveniences such as multiple windows for program execution, editing etcetera. PANOS is designed to offer compatibility with all existing BBC systems but it also offers extensions through alternative software interfacing that will preserve program portability. With three large volumes of documentation (excluding language manuals), this is clearly going to be a complex product which will require concerted evaluation in the flesh. I promise not to mention it again until I actually see one.

Which brings us to a final wind-up on the new language releases, a task complicated by the fact that other, apparently substantial, new PASCALs and LDGOs have also appeared from third parties in the last two months. One suspects though that these "official" versions will set the tone.

LOGO is a very nice implementation and the documentation is copious and well written. Among the material is an 80-page tutorial introduction to LOGO by Barry Morrell and a very comprehensive reference guide. Nice things about Acornsoft LOGO include compatibility with normal BBC filing systems, access to various facilities such as the VDU commands, and access to multiple turtles which can be created and killed during programs.

Having the BBC's graphics quality is a strong start and all modes can be used, with text and graphics freely intermingled. Junior schools, with an eye to running floor turtles (which doodle on the floor rather than the screen), will be

Video disks & training

In Britain, Acorn has established a separate company to manage the integration of video-disks for training and education and has produced a control interface standardised on the Pioneer Laservision player. Special units are available for training (and as a feather in Kiwi caps they are still waiting to have a VHS video-tape system operational at twice the price of Barson's CAVII).

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glad to know that commands for driving such a turtle through LOGO and the user port are built in to the interpreter.

I have only one criticism: the editor is functional and easy to use but not particularly powerful. Its main advantage is that it builds on from the normal use of the arrow keys but it's a pity that it fails to use the special function keys for items such as "delete character". Acorn has established some common ground in the use of the SF keys in View and Viewsheet and it would have been good for users if the same conventions could have been carried over into the languages.

The same is true of the PASCAL editor, which is far more powerful and uses the SF keys. But not in a manner entirely consistent with View. If you don't use View, this may not matter too much but in an educational environment a consistent editor interface would have been a nice design feature. This may be niggling though, as the PASCAL system has some nice features for a machine of its type.

Compiling of small development programs can be done within memory which, for small class programs, means fast compiling. Working with the environment is, in fact, fast allround since minimal disk access time is needed to get users in and out of the editor or compiler or run the code.

The interface to the BBC is beautifully standard with not only standard disk formats but also full access to MOS and VDU calls and machine code routines assembled via BASIC (its ability to segment large programs into independently compiled modules is, however, limited). It has a good compile time but more limited run-time error trace. A professional programmer friend, who has widespread experience of micro PASCALS, was particularly impressed by its ability to use variant records and conformal array parameters on the disk-based version. Note that the ROM-based version differs from the disk one (only for second processors) in supporting a lower level of ISO implementation but offering an environment with fewer disk access requirements.

Some brief experiments suggest speed advantage over BASIC varies between negative to notable. As we noted before, the compiler compiles to intermediate code . . . hence the slower speed and the fact that for the moment, only other PASCAL users who have a run-time module can run your code. But it can be fast in what can be a very tedious area – compilation. The language also comes with a book that seems a highly promising volume for all us poor hackers trying to gain respect with our colleagues. *From BASIC to PASCAL* is a very practical concept for an introductory guide for most of us.

Next month, a review of the MX-mouse which delivers some startling implementations of the concepts used in the Apple Macintosh's MacPaint. Could it be the basis of a mouse-oriented user environment on the Beeb . . . and if not, why not?

SPECTRUM

Faster BASIC

By Gary Parker

I'll never forget the first game program I wrote in BASIC. It was a maze game on the ZX81, written in the structured style I had learnt for PASCAL, with many subroutines neatly placed at the end of the program. I was in for a shock when I ran it. The little man took several seconds to make each move! At that point, it began to dawn on me that perhaps easy-to-read, structured programs were not the fastest programs. Now I'm sure: the worse a program looks, the faster it runs. This month's column covers ways to make programs run faster. Sticklers for neatness and structure should look the other way.

To understand how to make a program run faster, you should understand how the interpreter works. The interpreter is the part of the Spectrum (and all BASIC computers) which turns each line of your BASIC program into machine code as it comes to it, and runs it. Since the interpreter must convert each line while the program is running, execution speed can be improved considerably by making the interpreter's job easier.

First, take care to do things the simplest possible way when writing a program. Avoid repetitive calculations. For example, if two variables, A and B, seldom change value, don't repeatedly calculate:

```
X = A + 8 + C
```

Instead, add A and B and put them into a variable D once, and then use:

```
X = D + C
```

Expressions should be arranged so that as little as possible need be evaluated. For example, in this expression:

```
IF A = 4 AND D = 5 THEN GO TO 600
```

both equations are checked to see if they are true. But if you were to use THEN IF rather than AND, only the first expression would be tested. If it was not true, the interpreter could move on:

```
IF A = 4 THEN IF D = 5 THEN GO TO 600
```

This works just the same as the previous line, but runs about twice as fast when A isn't 4.

Tests for zero seem to be slightly faster than tests for other numbers. So arrange for numbers in loops, etc to count down to zero instead of up to a particular value. Rather than:

```
10 LET A = 0
20 LET A = A + 1
30 IF A = 50 THEN GO TO 200
```

use:

```
10 LET A = 50
20 LET A = A – 1
30 IF A = 0 THEN GO TO 200
```

Using loops like this is also faster than FOR-NEXT loops. FOR lines with STEP are particularly slow.

Logical (Boolean) operations are fast. See *Bits & Bytes* (April 1984) for more details on these. As a couple of examples:

```
LET X = X + (INKEY$ = "8") – (INKEY$ = "5")
```

is faster than

```
IF INKEY$ = "8" THEN LET X = X + 1
IF INKEY$ = "5" THEN LET X = X – 1
```

and

```
LET H = (Y = 1)
```

is faster than

```
IF Y = 1 THEN LET H = 1
IF Y < > 1 THEN LET H = 0
```

Many of the methods which speed up running speed rely on the way the interpreter finds each line. Each time you use a GO TO or GO SUB, the interpreter begins at the start of the program, and looks at every line until it finds the one you want to go to. So the more lines there are before the section of program being used, the slower that section will run. This means the most often-used sections should be at the start of the program, not at the end where they are usually placed.

Often, programs have all their variables declared at the start, and then the program itself begins. It would be faster to have the variables declared in a subroutine at the end of the program. You should also avoid GO TOs to high line numbers, and perhaps use multi-statement lines to reduce the number of lines.

The variables you use are stored in memory in the order you declare them, and the interpreter searches through this memory every time you use a variable. So declare the more often-used variables first. This will mean the interpreter can find them more quickly, allowing the program to run faster. For example, if you often use X and Y in a program, but seldom alter A, then declare them in this order:

```
1000 LET X = 22
1010 LET Y = 32
1020 LET A = 45
```

If you use only a few variables, this won't make much difference. But if you have a lot of variables or large arrays or strings, running speed can be substantially improved.

Finally, consider using machine code routines for simple, often-used processes. If you don't feel up to the task of writing the routines, a look through the computer magazines (such as last month's *Bits & Bytes*) will often reveal the ones you want.

Apple record

Apple Computer Inc has announced net sales of $US698.3 million for the first quarter of the 1985 financial year. This represents a 121% increase over the $US316.2 million in the first quarter last year.

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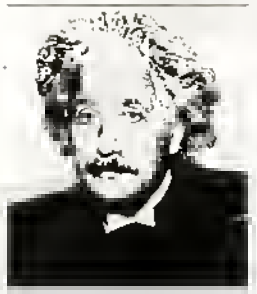

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Keeping track of information

By Gordon Findlay

Last month, we discussed the way information is recorded on a disk, leaving it at a point where we had considered writing and reading information in sectors and tracks. But for day to day use, track and sector access to the information on a disk is neither needed nor practical.

There are some situations in which it is useful to access, say, track 11, sector 5. This sort of access is used, for example, to modify protected programs, or DOS itself, to recover files accidentally deleted and so on. But the mention of files gives away the more usual way of storing information.

A file is a block of data on disk, with a name. The data might really be data – names and addresses, say – or a program file, or a BASIC program suitably encoded. It is much easier to store a BASIC program and load it back again using a name like GAME2/BAS rather than remembering that the program is stored in track 18, sectors 10-19, and track 23, sectors 0-4! It is the function of the disk operating system to look after all such details – where each file is physically located in terms of tracks and sectors and what space is full – and to allow us to refer to files by name.

A file saved by name may not occupy one block of space on the disk – it may be stored in several parts, depending on what spaces are available. DOS needs to keep track of what is where, and so uses some disk space to store the index to the disk. This file is the directory, and may be found in the file DIR/SYS. Other files are necessary to actually store the operating system itself – these are files SYS0/SYS, SYS1/SYS, etc, or sometimes DOSD/SYS... These files are usually invisible to you, and you will notice they are on the disk only because they use up space!

The operating system must have provision for at least four functions: we must be able to save files, load them back, remove (''kill'') them, and find out what files are on a particular disk. DOSes usually have many other facilities. Some of the most important are: copy one file from a disk to another; make a backup of a whole disk; change the name of a file; prepare a disk ready for use (''format'' it); display the contents of a file on screen (useful when you've forgotten what a file is!) append files to each other. Most TRS80 DOSes will do a lot more as well – mostly related to the varying configurations the TRS80 may have.

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Importance of file names

File names are very important. A file name in TRS80 is very similar to a CP/M file name, other than punctuation. First, we need to remember that if a system has just one disk drive, it is called drive 0, the second is called drive 1, and so on. Rarely will the drive number be needed other than in copying files or disks – TRSDOS and all its successors were among the earliest operating systems to search all drives for a file if the drive wasn't specified. Working with systems which do not have this simple ability makes me appreciate it more!

A file name itself is in three parts. The first part is the most important – the actual name itself. This is one to eight characters long, letters and digits only, and the first character must be a letter. Typical example: GAME2. To this is added the extension, which is a three-letter group, usually designating the type of file. Thus if GAME2 is in BASIC, I will always call it GAME2/BAS. If the game was in machine code, it would be GAME2/CMD. It is permissible to have no extension at all: some people (often including Tandy) use no extension to indicate the file is a BASIC program. I have religiously avoided this – there are many utilities which look for ''/BAS'' to determine which are the BASIC programs on a disk. Instead, I use the convention that no extension means a file which is very temporary – remove it when the session is over.

Other commonly used extensions are /SRC, /MAC or /ASM for assembler source code; /CIM for memory dumps (exact binary copies of blocks of RAM); /JCL for files of commands (more on this later), /SYS for system files; /LIB for files of library subroutines, and many programs use their own extensions for data files of different types.

Having used systems without extensions, and suffered through the unwise use of them, I can recommend a systematic approach. There are 33,696 possible extensions, so the choice is wide. I have accumulated a very large number of text files over the last few years, and in a final desperate attempt to organise myself, have taken to using /REV for reviews, /TRS for this column, /BEG for beginners columns, /LTR for letters, and so on.

A couple of extensions

Two extensions mean specific things to DOS. As mentioned already, /SYS is used to refer to files which are part of DOS, or used only by DOS, such as DIR/SYS. There are a few exceptions – PENCIL02/SYS and so on – but by and large, leave SYS files alone. Every disk will have at least two – BOOT/SYS and DIR/SYS. The other important extension is /CMD, an abbreviation of ''command''. These files are programs which may be executed from DOS just by giving their name. My communications program is called PP/CMD, and typing just ''PP'' gets it loaded and running.

The other part of a file name is a password. If I wanted to protect the game with the password ''GORDON'' and it is stored on drive 1, the whole file name becomes ''GAME2BAS.GORDON:1''. Passwords might be useful in some situations – businesses perhaps – but I haven't encountered many! For the time being, we'll ignore them.

As well as the files themselves having names, the disk has a name and date. These are given when it is formatted, but some DOSes allow them to be changed. The name and date can be very useful for keeping track of your disks, especially if your DOS allows you to include a comment in place of the date. This text will end up on a disk whose name is ''TEXT9'' – indicating that it contains text files, and the ninth one started for that purpose. The ''date'' of the disk is ''B&B'', indicating that these text files are for *Bits & Bytes*. Other text disks have other ''dates'' indicating the purposes of the files. Inevitably, one of them is ''TEXT3'', with date ''MISC''!

Incidentally, although disks aren't cheap, it is much more convenient to group files together in disks with a common purpose, rather than cram everything in together. Games may well have their own disks, as will other programs with similar purposes.

A distinction must be made between ''system'' and ''data'' disks. Simply, ''system'' disks have at least some of DOS on them, enough to boot up anyway. A data disk won't boot, because it doesn't have DOS on it. Not all of DOS is in RAM at once (it's too big) and generally, it is essential to have a system disk in drive 0 at all times, so that if another part of DOS is required, it is available for loading. Data disks can, with a few exceptions, be used only in drive 1 and higher.

The next thing to look at is the ''mother'' of the DOSes, TRSDOS.

A gun war game

By Michael Fletcher

A couple of weeks back browsing through my local computer store, I was surprised to stumble on quite a few titles from the famed British software company, US GOLD. This could mean hundreds of new software titles at the relatively low prices of $45-$60. US GOLD is not a software company but imports some of the best American software.

These titles include F15 Strike, Eagle, Spitfire Ace, Mig Alley Ace, Solo Flight, NATO Commander, Flak, Snokie, Dallas, Beach Head, Bruce Lee and many more. Most are in New Zealand at the moment and I am told more are soon to come.

NATO Commander is an impressive new war/strategy game comprising a very exciting and new outlook on the modern strategic battle game.

The date is in the future and for the past week, rather disturbing news has been emitting from behind the East German border.

APRIL 21, UPI... BRUSSELS: The new commander in charge of NATO forces (you) was sworn in today at Brussels.

APRIL 22-23, AP... WITTENBERGE: The newly formed East German labour movement claimed that many of its members are striking in the town of Wittenberge. Reports from West German sources indicate that masses of refugees are crossing the border in that vicinity. On the same day, East Germany accused the West German government of supplying food and weapons to the striking workers at Wittenberge.

REUTERS... FRANKFURT: NATO forces were put on alert level 3 and all NATO leaves have been cancelled. Tension along the East German border increased today as the West German government boldly admitted to helping the striking workers at Wittenberge.

REUTERS... MOSCOW: The USSR threatened to break the striking workers by force if necessary. It also warned West Germany to stay out of the affairs of a Warsaw Pact country.

The cover of the NATO Commander game and a scene from the war map.

AP... WITTENBERGE: East Germany today announced talks with West Germany aimed at the reunification of the two Germanies, West Germany however refused to confirm or deny the existence of these talks.

APRIL 30, REUTERS... BERLIN: All access to Berlin was closed today by East German authorities. American and British outposts report contact with Russian mechanised units. The Soviet government refused to acknowledge fighting on the East German border but noted that "appropriate measures" had been taken.

The date is now April 30 and you, as commander-in-chief of all NATO forces in Europe, have been handed a briefing of the position and number of Warsaw Pact forces poised on the borders of NATO countries. It is your job now to use your initiative to issue orders and repel the Russian hordes sweeping across the West German borders.

The game, NATO Commander, is based on a war with Russia and other Warsaw Pact countries. You are the commander of the French, British, American, Belgian and German units in Europe; it is your job to issue orders and repulse the invaders. To help you, you have many diversified units and orders which will be explained later.

Choice of 5 battles

NATO Commander starts off by giving you a short text rundown of what has happened in the past week and then offers you a choice of five battles you can fight.

- Surprise Attack: Warsaw Pact launches a surprise attack against unsuspecting NATO forces. In this scenario, only the northern half of the war map is shown.
- Hanover Hamburg: This again shows only the northern half of the war map. The objective of the game is for the Russians to capture Hamburg and Hanover.
- Pre-emptive strike: This is my personal favourite. The NATO player takes the initiative and attacks East Germany. This time, the whole map is used.
- The Italian option: Warsaw Pact forces attack along the West German front but offer peace to the Italians. In this mode, the object is to save politically important targets such as cities so that the Italians will join the war on your side.
- The battle of Germany: This scenario uses the whole of the war map and covers a pre-emptive strike from East Germany.

After the scenario choice, NATO Commander offers you four difficulty levels. You are then presented with a local news report of what has happened.

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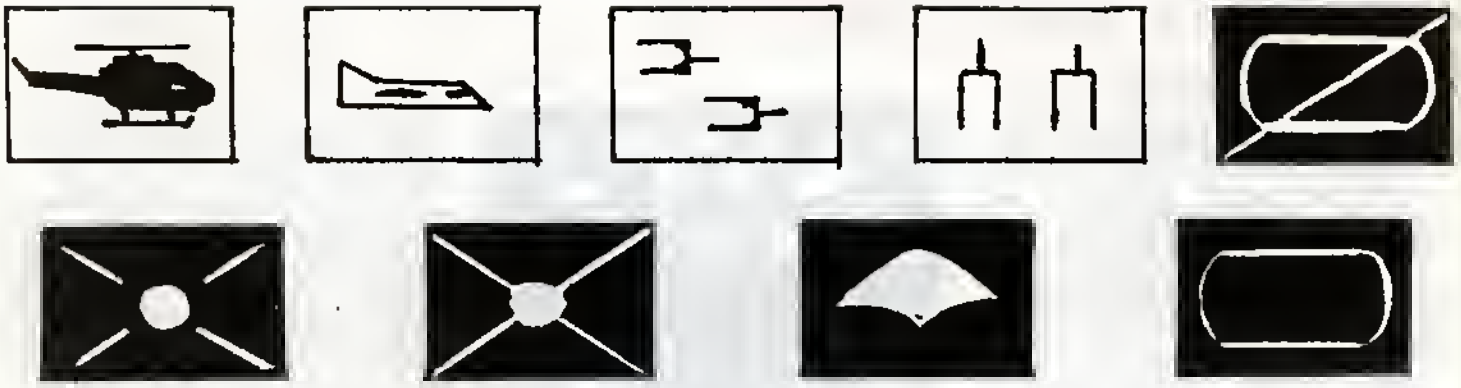

The units at your disposal . . . (clockwise from top left), helicopters; air wing; surface-to-air missiles; tactical nuclear missiles; armoured cavalry; armour; airborne; mechanised infantry; militia.

For example, if you chose the pre-emptive strike option, a news report would show that NATO forces have pushed over the Russian borders and wiped out the Russian aircraft on the ground. Because of this action, world opinion is greatly against you so political targets such as cities have double points.

After pressing RETURN, a scrolling map of Europe appears on the screen. This map is where all the fighting in NATO Commander takes place. In the centre of the screen is a rectangular cursor, which you, as NATO commander, use to control your forces. Also on the screen are about 30 rectangles which are your forces, (blue, black and green) and about 15 red rectangles which are the Russians. There are also some smaller rectangles which represent brigades instead of the normal divisions.

You can use nine different units to repel the invading Russian units. At your disposal are (each shown by a picture): mechanised infantry (the powerhouse of an army, best used for defence); armour (fast moving and best used for attacking); armoured cavalry (used mainly for reconnaisance); airborne (used mainly to attack lightly defended rear installations); militia (best suited for a prepared defence); helicopters (used to help eliminate Russian ground forces); air wings (mainly needed for attacking Soviet aircraft and helping ground offensives); surface to air missiles (needed to destroy overflying Warsaw Pact aircraft); tactical nuclear missiles (can be used to wipe out entire Soviet units).

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When NATO Commander actually starts, the action is fast and furious – especially when at the start of every game there are always three NATO units behind enemy lines surrounded by four Soviet shock divisions. After realising the position, one of the units radios you for instructions giving you your first chance to use the many commands offered to you. The best thing to do in, this case is to first press (F) to freeze the game. Then order one unit to attack by using the command (A) and use the commanded (H) to tell where to attack. You will then be offered three choices of attack – accelerated, normal and chemical. After you choose which form of attack you want, the computer will answer by saying: "brigade ordered to attack – roger". On doing this, use the command (M) to move your unit away from the Russian attackers, and again use the commands (A) and (H) on your helicopter units to attack the remaining Russian force.

The other commands used are:

(O) – placed on any unit other than an air wing or a tactical nuclear unit; will offer you three options for a defence (hasty, prepared and tactical).

(G) and (O) – will show you the status of your ground and air forces.

(X) – will allow you to cancel an order, and then issue new ones.

Pressing the space bar will show the status of the unit — how many men and tanks are attached, and morale.

All the movement on the scrolling war map is controlled by either the joystick or cursor control keys. The command used for controlling the air arm is (O). If this key is depressed while the cursor is on an air wing rectangle, you will be offered a three option menu of what you can do with those planes — air reconnaisance, air superiority, ground support.

To fire a nuclear weapon at the Soviet troops, you have to first position your cursor over one of your missile silos and then press (O). You will be given another three option choices — request a nuclear strike; target nuclear strike; cancel nuclear strike.

To fire a nuclear weapon, you have to get permission from the US president. This authorisation is not easy to get and is given only if you are being desperately beaten or the Soviets have fired atomic weapons at you. If you are allowed to fire nuclear weapons, press 2 and then position your cursor on your selected target. In a couple of minutes, that unit will be blown off the face of the earth. However, because you have used nuclear weapons, you will lose political points from your total.

At the end of each day of fighting, the war map will disappear and you will be shown a news report on the day's fighting. The report will contain all the losses for the day and how far the Soviet forces have advanced. Tactically, it is a good idea to take notice of this report and use it to its utmost.

Other good tactics are to use the helicopter squadrons as much as possible to wipe out ground forces, and always try to attack with tank squadrons.

Positions your defensive units to take advantage of terrain. River lines and mountains are the best. Always try to have two units defending rather than one.

At the start of the game, always use you air arm for air superiority missions. Change to ground support missions only when the news says there is very little or no Warsaw Pact air opposition. And don't be afraid to use the freeze feature while you enter orders. NATO Commander ends when one side offers peace terms.

This must be one of the best war strategy games I have played on the Atari. Out of 10, I would rate it an eight. It is 48K on a disk and costs $59.95 from most Atari agents.

Accounting packages

MEC Dealer Products has released the Panasonic Portable and the Cashlink integrated accounting package.

A bit different

Microsoft BASIC and its Files by Jacques Boisgontier (translated by Suzanne Ropiequet). dilithium Press, 1983. 200pp. $19.95. Reviewed by Gordon Findlay.

A little different from most books on BASIC this. It begins by assuming the reader is already familiar with at least the elements of programming, and sets out to cover programming involving files.

The first part of the book (some 32 pages) introduces the statements used in MBASIC to manipulate files of data. Both random access and sequential files are covered. The book has a number of examples which show how to use files to store data. Program segments show how to open files, place data in them, retrieve data from a file, and also how to alter the records in a file.

The second part, of around 60 pages, gives a deeper treatment of some of the important techniques — sorting a file, the use of index files, dynamic file allocation. An interesting chapter gives practical suggestions for handling data through a "data file management system", or a system of records and pointers which relate different files. Various important practical issues are raised, such as the need to protect files, and to archive data. There are also some helpful points about screen input.

The remainder of the book is a summary and reference guide to Microsoft BASIC, specifically MBASIC version 5.0. This is all good stuff, and it's nice to have it all together; but even relatively inexperienced programmers will find it redundant.

As well as the standard MBASIC, as used most commonly under CP/M, translations and modifications are given for TRS80 BASIC.

The book is cleanly presented, with a nice typeface, and good diagrams. One or two program listings are a bit blurred — they are reproduced directly from listings.

Not a great book, but it meets its goals, and goes give a good introduction to one of the more difficult topics in programming.

Keeping up with your hardware

The Handbook of Microcomputer Interfacing by Steve Liebson. Tab. 262pp. $34.50. Reviewed by Ted Brown.

For those who work at, or desire to work at the hardware level of their computers, this large book has very much to offer. It has nine chapters, starting with Boolean algebra, flip-flops, number systems and a general introduction.

After describing many of the popular CPU chips in detail, we go on to various busses such as S100, STD, and 488. Parallel interfacing comes next, with some popular and up-to-date PI'Os and PIAs described in very great detail.

Leaving these behind, we come to serial interfacing which is treated just as thoroughly as the parallel section. RS232 and some more recent serial standards are very well covered. This is the place to learn about UARTs, USARTs and serial input/output chips from many manufacturers.

Analogue to digital and vice-versa are treated at length but there is no rundown on individual chips because, as the author says, there

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BOOKS

are just too many of them.

Timing chips such as the Z80CTC, Intel 8253 and several others have their inner workings fully exposed. A chapter is given over to interrupts while another takes us through DMA or (direct memory access) interfacing.

There are three appendices but only one is really useful. This covers all the chips available under the above headings. It is a most comprehensive list and is right up-to-date.

This book does not take you as far as the blurb on the back cover would have you believe and it is not for beginners, but it is still good value.

Reviewer hooked

Computer Art and Animation: A User's Guide to Radio Shack Colour Logo by David D. Thornburg, reviewed by John Durham.

Despite being subconsciously anti-logo, I was pleasantly surprised by this book which suggests in its introduction that it is possible for a programmer to become an artist, or for an artist with no computer experience to become a programmer.

Logo could be described as being to graphics what Forth is to maths and programming – except that Logo is easier to learn.

This book teaches the fundamentals of the Logo language in a carefully paced and easy-going sytle, with plenty of illustrations. The book contains exercises to help develop the reader's understanding of the subject, and gives plenty of hints to encourage personal creativity.

One of the most fascinating, and one of the best explained aspects of Logo in this publication, is its ability to learn new procedures, and then use those procedures to define other words, since every new definition becomes part of the language as you work.

There appears to be only one drawback to this work, and it is not the fault of the book. Chunky graphics are one characteristic for which Radio Shack computers are well known, and you might have thought this feature makes them singularly inappropriate for artistic work.

Radio Shack on the other hand, typically treats the machine as if the limitation were not there, with the result that the system is capable of developing extremely sophisticated graphic art, which not only produces recognisable images on command, but can make them move about as well.

I admit to having developed an interest in the language as a result of reading this book, and I would recommend it to anyone with an interest in art, animation or Logo as a language.

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The New Zealand Microcomputer Software Awards

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Bits & Bytes Ltd, publishers of New Zealand's largest circulating computer magazine, Imagineering Ltd, one of New Zealand's leading software companies and the New Zealand Technology Advancement Trust, a body established specifically to promote technology, are pleased to announce the formation of the above awards to be presented for the first time in May this year.

The organisers feel it is time New Zealand software is given the national and international recognition it deserves. The establishment of the awards will provide an opportunity for that recognition and in particular it is hoped they will lead to increased export sales of New Zealand software.

The awards are open to any company or individual to enter and there is no limit on the number of entries (a suite of programs may be submitted as one entry or as separate entries). A $10 nomination fee applies per entry. Programs entered can be an already established commercial product or as yet commercially unavailable.

In 1985 the awards will be presented in two categories only:

1. **Business** – This category covers any software program aimed at general commercial use. For example general accounting, wordprocessing graphics and farming programs. Vertical market packages i.e. those aimed at one particular industry (other than the farming industry) are excluded.
2. **Education and Recreation** – This category covers any program for use in an educational role, or a game, simulation program or any other program intended for enjoyment etc.

THE AWARDS

Judging will be carried out by independent and accomplished computer experts in the category areas according to specific criteria.

Category winners will receive an award trophy and merit awards will also be made where appropriate.

The overall winner will receive the 1985 New Zealand Microcomputer Software Award plus $2000.

The awards will be presented at the New Zealand Microcomputer Industry Dinner to be held at Trillos in Auckland on Thursday, May 9 in conjunction with the PC 85 exhibition.

Entry form

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Send no money or programs now. You will be contacted at a later date.

The following conditions apply:

1. *The software must be wholly developed and written in New Zealand.*
2. *It must run on at least one microcomputer model.*
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And the books:

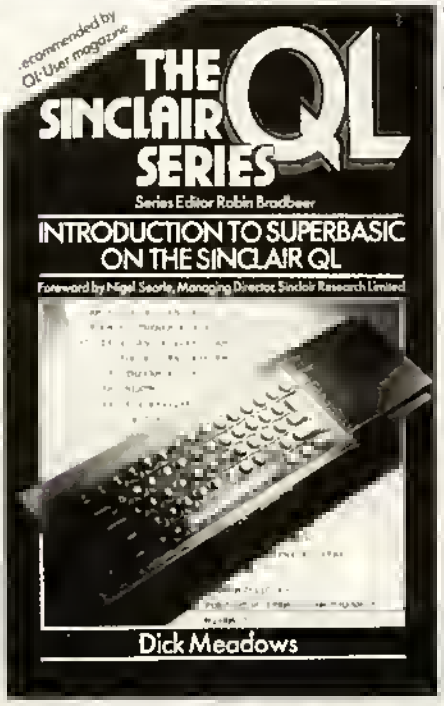
Introducing the Sinclair QL — **Garry Marshall**
Explains how the QL works and what you can do with it. Aimed at the first-time QL user, the newcomer to computing and experienced user who wants the machine up and running as quickly as possible. No prior computing knowledge necessary.

Introduction to SuperBASIC on the Sinclair QL — **Dick Meadows**
Explains SuperBASIC to both the programming newcomer and the programmer unfamiliar with it. Covers features, ideas and methods for programming, begins to write programs, inputting and outputting information, making decisions, repetition, special functions, processing strings, using arrays and procedures, and user-defined functions.

Word Processing With the Sinclair QL — **Mike O'Reilly**
As well as the concepts behind the uses of word processing, it explains how the QL's word processing package, Quill, operates and what it can do. Aimed at the newcomer to word processing and the experienced user wanting to fully understand Quill's capabilities.

Advanced Programming With the Sinclair QL — **Martin Gandoff**
Aimed at users with a working knowledge of SuperBASIC who want to move to more advanced programming. Covers such topics as programming logic representation, types of commercial program, programming techniques, development, testing and live running applications and document design. Also includes a statement and reference section.

Desktop Computing With the Sinclair QL for professions and businesses — **Barry Miles**
Shows what can be achieved in business computing, explaining how the user can exploit Sinclair's four software packages — Quill word processing, Abacus financial calculations, Archive database management, Easel business graphics. Assumes no prior computing knowledge.



Business

Databases for Fun and Profit — Nigel Freestone

For users wanting to do their own programming. Provides straightforward introduction to data processing, with explanations of routines in BASIC. Examples of system designs for home and business use, which you can combine and expand. Systems for names and addresses; cataloguo/index; diary; stock control; bank account/budgeting; debtors list/sale/purchase ledger; payroll.

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Dissects data and file management, focussing on how you can effectively use modern database systems and how to get the best from them. Thorough overview of databases, practical examples and exercises, discussion of widely used databases, the "how tos" of report writing, indexing and cataloguing; database design for protecting data.

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Choosing Your First Computer System: A Guide for the Growing Business — K. Ian Mitchell & Beven J. Clarke

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Understanding dBase II — Alan Simpson

Clear, concise text and eye-catching graphics help you master the basics, then guide you through programming techniques for useful applications such as mailing label systems, graphics, bookkeeping, printing and formatting reports. You also learn to interface dBASE II with other software systems to expand its capabilities.

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Simply dBASE II — Barbara S. Chirlian

Straightforward guide to get you going with this database management program. Teaches you enough so that you can use the parts you need, and explains how dBASE II handles information, what the program does with the information to make it useful, and how to retrieve information. Lots of illustrations and four appendices, listing — dBASE II commands, functions, configuration parameters and glossary.

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Advanced dBASE II User's Guide — Adam B. Green

Collection of tips, techniques and practical programs tested and refined over two years of seminars around the USA. Practical advice on software tools; controlling program flow; macros; strings numbers; dates; relational data model, other data models, repeating damaged data files; debugging; writing an add-on; hacking; benchmarks.

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Business Program Portfolio for your Apple IIe; An Integrated Office System — George H. Hildebrand

Collection of 61 BASIC programs covering such office tasks as interest calculation, financial analysis, depreciation, property management and real estate, cash receipts and disbursements, job cost, payroll. All programs documented for implementation and modification. There is also guide to printing our business forms, creating a menu system, and securing business records with password programs.

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On-Line Computing for Small Businesses — Silver's Wall — Maurice A. Silver, John Seacocke & Ray Welland

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Computer Basic for Managers — Ralph Morris

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Language/programming

Microsoft BASIC and its Files — Jacques Boisgontier & Suzanne Roplequet

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The MS-DOS Handbook — Richard Allen King

An in-depth look at MS-DOS's internal functions, showing how to get the most out of the operating system, how to eliminate repetitive operations and how to streamline common procedures. Covers file structures and disk layout; changing the meaning of keys; using serial and parallel ports; looking inside the system with DEBUG; information for programmers using advanced MS-DOS functions. Covers various MS-DOS versions, and has tables, maps and many practical examples.

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Doing business With Multiplan — Richard Allen King & Stanley R. Trost

Quick, well set out guide presenting more than 20 accounting and management planning applications for the business user. Each is thoroughly described, and a complete template for setting up the application in Multiplan presented. Many usable "as is"; others can be modified for specific problems. Covers record keeping, financial statement analysis, sales finance, manufacturing, master budgeting.

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The ABCs of 1-2-3 — Chris Gilbert & Laurie Williams

[illegible] using a worksheet, and [illegible] worksheet. Lessons involve tackling projects such as building a worksheet, displaying the worksheet as a graph, building a database, simplying several operations using macros, performing calculations and printing graphs and reports. Remains a handy reference once you are familiar with 1-2-3.

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Structured Programs in BASIC — Peter Bishop

Opens with a discussion of program structure and design. The rest of the book comprises example programs, with the complete program design process (from initial specification to final listing) carried out. Excellent source of programming techniques, algorythms, program modules, ready-to-run programs and ideas.

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Mastering Symphony — Douglas Cobb

Business-oriented, hands-on approach by the author of two books on 1-2-3. Many examples and illustrations, and an attractive layout. Covers spreadsheets, database management, word processing, graphics, communications, command language, and offers tips on integrating the various functions. Packed with actual examples and practical applications.

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Apple

Getting Started With ProDOS — B.M. Peake & D. Rorke

Aimed at Apple II and IIe users, this is intended for someone familiar with the existing Apple DOS 3.3 systems. Comprehensive guide to ProDOS, with exercises for practice. Reference section goes over commands and commants on their use, and there is a discussion of the advantages and disadvantages of the system. A list of further references is included.

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Second edition revised to cover the Apple II Plus and IIe. A manual for New Zealanders to learn BASIC with the Apple, instead of picking information from two or three sources. Includes model answers. Enquiries for class sets welcome.

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Apple Logo: Activities for Exploring Turtle Graphics — Harold J. Bailey, Kathleen M. Brautigam & Trudy H. Doran

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An Expert Guide to the Spectrum — Mike James

Practical introduction to the Spectrum's advanced hardware and software features. Aimed at the user seeking a deeper understanding of the machine and its capabilities. Starts with an inside view of the micro, then moves to a connoisseur's guide to ZX BASIC and an introduction to the machine operating system. Covers ZX video, tape system, RS232 interface, microdrive and advanced programming techniques. Complete program listings and projects for further exploration.

Grenade — Our price $23.70. Save $1.25

Practical Spectrum Machine Code Programming — Steve Webb

Designed for programmers who want to write faster and better programs than they can in BASIC. Assumes you have no knowledge of machine code and works through the details to the point where you are linking routines and using routines with BASIC programs. Questions throughout to test progress.

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Commodore 64

Basic Subroutines for Commodore Computers — Eddie Adams

Easy-to-use manual which offers access to more than 300 BASIC subroutines — powerful building blocks you can combine and adapt to create programs for a wide range of business, educational and personal applications. Explanations for each subroutine with suggestions for modifying it to your needs. Each program is ready to run on any Commodore system.

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Commodore 64: Basic Programs in Minutes — Stanley R. Trost

Collection of versatile, ready-to-enter programs for more than 65 home and business tasks on the Commodore 64. Programs for home finances, business calculations, real estate, data analysis, record keeping and education. No knowledge of BASIC programming needed to use programs which can be entered and ready to run in less than 10 minutes.

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How to Program the Commodore 64 — if you've never programmed a computer before — Robert Young

After an introduction to the bits and pieces of the 64, you move to the process of learning to program on the keyboard. Concentrates on the key words and techniques to have you writing programs as quickly as possible, then allow you to refine the process at your leisure.

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Introduction to the computer and its basic components, explains what the components do and how they work together, step-by-step instructions on setting up and installation, shows how to read and save programs on diskette or cassettes, tells how to type in, use and modify programs, presents other sources of information.

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Commodore 64 Machine Language Tutorial — Paul Blair

Gets to grips with the intricacies of machine language programming, helping you overcome the demanding, exacting and sometimes exasperating requirements. But master it and tasks such as sorting, searching and some graphics become much quicker. Judicious use of machine language also allows you to use larger and more complex programs. Demonstration program provided, with examples of short machine language routines.

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Data Handling on the Commodore 64 Made Easy — James Gatenby

Data processing – sorting raw facts to produce useful information – can be just as rewarding as playing games. Explains how to use the Commodore 64 to process information for the home and small business. Uses straightforward examples to demonstrate storage of large quantities of data, attractive and readable on-screen display, and searching and print-outs.

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Advanced Machine Code Programming for the Commodore 64 — A.P. & D.J. Stephenson

Details the 6502/8510 microprocessor with particular attention to the multiple-byte handling and high-resolution graphics. Number of fast sorting routines are described and methods outlined for using machine code to improve the speed and smoothness of animation and sound. Many examples as illustrations and for practical use.

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Commodore 64 Assembly Language — Bruce Smith

Comprehensive introduction to assembly language with plenty of sample programs and a full description of the 64 instructions the 64 understands. All programs designed using DATA statements so that you can key them in and go. Mnemonics included for those with an Assembler. Gets into hex and binary; registers and flags; jumps, shift and rotates; the Kernal; and machine code sprites.

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Illustrated Guide to the Commodore 64 — Ken Uston

No-nonsense instructions designed to allow you to master one application without reading the whole book. Covers all major applications – including word processing and spreadsheet calculations.

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More Games For Your Commodore 64 — Robert Young

More than 20 programs including Lunar Base, Trail of the Serpentine, Tail Gunner, Reversi, Battle Fear, St Moritz, Aces High and Final Trial. Plus program writing hints and a glossary.

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Commodore 64 Disk Systems and Printers — Ian Sinclair

Discusses advantages, principles and details of disk systems. Looks at machine code loading and saving, filing and disk utilities. Printers discussed, their practical operation examined and word processing and graphics applications covered.

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The Complete Commodore 64 — Dennis Jarrett

Comprehensive, well-presented guide to the 64. After an introductory chapter, it goes into programming, hardware, business uses, and a resource directory. Combines features of a reference guide and tipsheet.

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Graphics Guide to the Commodore 64 — Charles Platt

Works through the 64's graphics features, showing how to control screen colour, load and save programs on disk or tape, create headlines and detailed pictures, animate a video picture, make programs run faster, and invent your own video games.

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Adventures for Your Commodore 64 — Duncan Quirie

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40 Educational Games — Vince Apps

Editions for the Commodore 64 and the Electron. Developed with the help of educationalists and a professional programmer, programs have been designed to help younger family members handle the machine and increase their general knowledge. Subjects include languages, geography, mathematics and science. Hints show how program contents can be changed to suit the family as skills develop.

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Each book contains a selection of more than 20 games which allow you to hone programming skills as well as have plenty of fun. Contains brief dictionary of computer terms, bibliography and hints on how to improve and extend some of the programs.

Commodore 64 edition $11.35 — Save 60 cents
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Using Your IBM Personal Computer — Lon Poole

After previous popular books on the Apple II, BASIC and the Atari, Lon Poole has now turned to the IBM PC. This comprehensive book is in two parts – for those who want to use only packaged programs; and for those who have never programmed a computer but want to learn BASIC programming. Also includes familiarity chapters with the hardware, sections of graphics and sound, and summaries of BASIC, PC DOS, error messages and characters, codes and keystrokes.

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IBM PC Programming — Richard Heskell & Glenn A. Jackson

Hands-on, step-by-step approach for beginning and advanced programmers. Uses actual photographs taken from the computer screen in graphic examples to develop many fundamental programming concepts. Includes information on string variables and functions; IBM PC DOS; numerical variables and arithmetic; expressions; sound effects; medium resolution graphics; loops and subroutines; bar graphs; animated graphics.

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The IBM PC-DOS Handbook — Richard Allen King

A complete guide intended to give you confidence to be creative with your computer's capabilities. Reveals features and functions inside PC-DOS, what you can do with them, and how they go together. Second half of book shows how to become adept at using PC-DOS's more advanced features.

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The IBM PC Connection — James W. Coffron

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IBM BASIC: An Introduction to Programming in BASIC on the IBM PC. — Donald T. Payne & William R. Bock

Each chapter opens with a problem-solving situation encouraging you to think on your own and experiment for a deeper understanding of the principles involved. Simple problems in early chapters teach you how to use, understand and modify programs. Gradually, the emphasis changes to creation of your own programs for business, home and entertainment.

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IBM PC for Kids From 8 to 80 — Michael P. Zabinski & Francis H. Short

Easily followed, fun book covering the most important programming concepts. You are encouraged to try as many examples as possible. Includes "instant replays" for second explanations, experiments, challenges, exercises (and answers, just in case), review checkpoints, recreation and funtime.

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Computer Playground: IBM PC — M.J. Winter

Based on a child's interest in words, games and graphics, this collection of BASIC computer activities presents each as "problem" in workbook format geared to the children's level. They type in and run sample programs, learn how to modify them and complete partially written programs. Commands are introduced progressively.

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Interfacing Projects for the BBC Micro — Bruce Smith

Describes how to plug into the outside world and operate a variety of devices connected to and controlled by the BBC. Projects include: burglar alarm, rain detector; light pen; EPROM programmer; X-Y plotter; joystick controller. Construction details provided, plus circuit diagrams, veroboard layouts and component lists. Tested and debugged programs to get projects running.

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The Second Book of Listings — Martin Bryant

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Further Programming for the BBC Micro — Alan Thomas

Uses more than 90 programs to demonstrate the BBC's special features. Listings accompanied by notes on points of interest and hints on extending and improving the programs. Further ready-to-run programs also included.

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Covers hexadecimal and binary; the registers; the mnemonic assembler; absolute and indirect addressing; stacks and flags; MOS routines. Full uncensored description of CALL and USR, showing how strings and variables can be passed into machine code programs. Appendices include description of 6502 chip's 56 instructions, machine code graphics and sound, including PLOT, SOUND and ENVELOPE.

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Practical Programs for the BBC Micro — Owen & Audrey Bishop

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Symphony Encore Program Notes

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Phil Kenyon & Mark Varcoe

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How to Write Adventure Games for the BBC Model B & Acorn Electron

Peter Kilworth

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The Micro Manual

Stewart Hasted

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Alan R. Miller

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Commodore 64 Machine Code Master: a library of machine code routines

David Lawrence & Mark England

Provides full listing and explanation of Commodore 64 master code assembler, then offers a collection of tested machine code routines to extend C64 BASIC with more than a dozen new commands. All routines fully explained, providing an introduction to a wide range of programming techniques and ways in which the C64 ROM can be used to best advantage by the machine code programmer.

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Jonathan Griffiths

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Howard Horner

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David D. Thornburg

Allows children to develop computer programming and geometry skills through use of a commonly available toy – a robot vehicle. Programming is introduced as the communication tool through which the child conveys instructions to the machine. Mastery and control of a simple and inexpensive "computer" becomes the training experience allowing children to create their own programs on larger computer systems.

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Graphics Programming on the IBM Personal Computer

J. Edward Volkstorf, Jr

Comprehensive primer which teaches you all the BASIC statements related to graphics. And once you've mastered the fundamentals, you can experiment with the concepts by running the programs. More than 60 applications include business plotting, cartography, educational exercises, animation and games.

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The Commodore 64 Program Book

Vince Apps

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The Penguin Book of Personal Computing

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Illustrated, easily-followed course for anyone considering buying a microcomputer or wants to know how to use one. Covers how personal computers work, attachments (keyboards, VDUs, cassettes, disks and printers), programming languages, operating systems, application programs (games to business systems), assessing the market when buying software, home and business applications; networking.

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COMMODORE 64

From page 58

because Commodore has just had a very bad Christmas season. It made a profit of only $3 million, compared to a profit of $50 million for Christmas 1983. It is estimated that Commodore has over $400 million of unsold stock. As a result, Commodore has laid off 10% of its staff in USA and 15% in Britain.

Another problem for Commodore is that most of the C-64's competitors have recently slashed their prices. The Atari 800XL, Spectrum Plus and Electron are now selling near the old VIC price. Commodore really must respond by dropping the price of the C-64.

In fact, I can see a long and healthy future for the C-64 selling at a cheap price. That will then leave room for the C-128 to come in at the old C-64 price.

This is the turning point for Commodore. For the last two years, it has raced ahead of the competition, but now it has lost its momentum. If Commodore wants to maintain its lead, it must cut its losses and concentrate on the C-64, the C-128 and the Amiga.

Assuming that Commodore is going to do the sensible thing, I would like to make some predictions for the New Zealand market:

- The price of the C-64 will be cut in the next few months to $595 or less. It will sell very well at this price and will hurt the competition, particularly the Sega, Electron and Spectrum Plus.
- The C-128 will arrive in early spring at $1295 or less. It will be an immediate success and will sharply cut into the market of the more expensive eight-bit computers, like the Apple IIe.
- At the end of the year, the Amiga will be released. With a single disk drive, it will sell for $2995 or less. Initially, there will be a flurry of sales, followed by a gradual increase as more and more software is developed.

On a more pessimistic note, Commodore may keep producing the C-16 and Plus 4; it may leave the C-64's price unchanged; it may delay the release of the Amiga. If so, Commodore's future is bleak. Under Jack Tramiel's leadership, Atari is marketing its computers very aggressively. In particular, the new 68000 machine is very attractive. Unless Commodore rationalises its line soon, it's going to be left in the dust.

The next few months should be interesting. The struggle between Atari and Commodore may well determine what sort of computer most of us will be using in the 1990s. Right now, Commodore still has the edge, but it must move quickly if it wants to maintain it.

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